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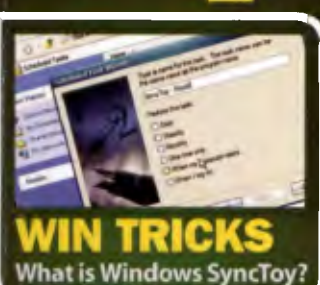
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DVD killer arrives

John Gillooly got the first Blu-ray drive in the country into the Labs. Does it live up to the hype?

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When you see this icon throughout APC, it means bonus software included on the cover disc.



This logo indicates a free, complete and unrestricted software package, available only on APC's cover DVD.

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Editorial

TONY SARNO



I'm pleased to say that we're the first mag in the world to secure a hands-on test of a real, production version of a Blu-ray drive. Blu-ray, or its competing format, HD-DVD, will make DVDs obsolete and will change the face of home entertainment, gaming and storage. While watching John Gillooly put the Samsung drive through its paces here in the APC Labs, it took me some considerable mental adjustment to accept that two discs would have been enough to back up an entire 100GB hard drive. Bring it on. And also bring on the impending battle between Sony (Blu-ray) and Microsoft (HD-DVD). The stakes are so massive, Sony cannot afford a repeat of the Betamax debacle of the 1970s. Unlike most of the companies vanquished by Microsoft in various sections of the PC industry over the years, Sony has really deep pockets, the hardware and content. For once, Bill is up against someone his own size.

This month, we reintroduce our buyers' guide, but we've expanded it from four to eight pages, to include most of the product categories people are likely to buy from. The essence of the guide (page 88) is to give you an instant ready-reckoner of the best overall and best value products. You no longer have to scan the reviews hoping to find a category of interest. If you turn to the guide you'll most likely find the top products in the category you want, as recommended by our independent reviewers. If you've noticed that our indexes up front have

shrunk from four pages to two, it's because we had to fit in the expanded guide. Another new section in the magazine is Exploding Technology. This is a personal favourite. We identify products likely to have interesting innards and take them apart like a coroner doing a post-mortem. Last month we featured a Seagate drive; this month, Bose's Jewel Cube speakers (page 108) for a DVD-based home theatre system. I chose them after being surprised at the sound such tiny speakers can produce. Since the Cube speakers can't be unscrewed, our Labs Editor Nick Race went down to the hardware store and bought a Dremel tool to grind them apart. He succeeded. This produced a burning chemical smell that got into the air con duct and which led to cursing from the magazine next door (hopefully I won't get any visits from Occupational Health and Safety). This month we also take a look at the insides of an Apple MacBook Pro, the first Apple notebook with an Intel chip — a historic machine if ever there was one. Despite the image on our cover, I want to assure Apple that we never use crowbars to open laptops. We took a photo of the crowbar for a laugh. In general, Apple notebooks don't like being taken apart, so we brought in a specialised Apple hardware technician to open it up, then let Dan Chiappini loose on its insides (page 38). After the top 300 Best Ever Products (March), reader Jim Wolz emailed us to point out that we didn't mention Norton Utilities. I agree it was a bad miss. If you used PCs in the '80s and '90s, Norton Utilities was utterly indispensable.

We identify products likely to have interesting innards and take them apart

STAFF FILE

Name: Declan Kennedy

Age: Born the year *Das Boot* was released

APC job: Web developer and Linux zealot

Interests: Writing, performing and producing music, making films, gaming

Favourite film: Chopper

Declan is building our new, yet-to-launch web site. From a media family, he has an interesting combination of journalistic and developer's technical skills. As a child, he was prevented from playing video games by his parents, because they wanted him to concentrate on his schooling. Undeterred, Declan instead taught himself Basic so that he could write his own games. "You haven't

lived until you've 'driven' a pair of exclamation marks down a vertically scrolling track made from equals symbols," he tells us.

Declan now programs fluently in five languages, and speaks fluently in two. Realising that some day he would like to have a job, he did a Bachelor's Degree in Digital Media at the College of Fine Arts in Paddington, Sydney. "Plus, there ain't no ladies like loony art-school ladies," he adds in for good measure. As for the future, his dream is to save as much money as he needs to open a scuba-diving resort in "some obscure tourist trap in Asia" and live out his days drinking daiquiris with

sunburnt Swedish backpackers. Scuba-diving resort? I guess I need to remind Declan of the IT industry's little secret: that nothing beats being a computer geek when it comes to attracting the opposite sex.





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Intel announces quad-core, predicts 100-core

Dual-core today, quad-core by next year... the sky's the limit, says Intel. *Dan Warne reports.*

Intel will ship quad-core processors by the end of this year, while pouring money into helping software developers optimise their software for multithreaded operation.

"We have something like 5,000 software engineers in the field working with independent software vendors," said Intel Australia's Daniel Anderson.

The chip giant says it will ship quad-core Xeon processors, codenamed "Clovertown", by early next year. They will be designed to run in dual-processor servers, providing eight CPU cores in total. A variant called "Tigerton" will then be released for quad-processor servers (16 cores).

As recently as December 2005, Intel was saying it wouldn't have the technical capability to ship quad and beyond before "the end of the decade".

Now, Intel's chief technical officer Jason Rattner says he can envisage a future where CPUs have 100 cores, and Intel has already demonstrated a PC running two prototype Clovertown processors.

AMD has not yet shown working prototypes, but Randy Allen, corporate VP of Server and Workstation at AMD, says it also plans to release a quad-core Opteron processor next year.

Both Intel and AMD have been struggling with the heat and power consumption issues associated with bumping up chip speed.

Intel is touting its future multicore processors as a power-efficient solution to the challenge of boosting performance without requiring industrial refrigerators.

Intel's new quad-core chips are part of a long-awaited new family of chips from Intel. They will be preceded by notebook and desktop

dual-core CPUs codenamed "Merom" and "Conroe" respectively. Both Intel and AMD are pitching quad-core at the server market initially, for data mining where tasks can easily be made to run in parallel, though Intel has also announced a quad-core desktop CPU (see full coverage page 16).

But Intel Australia's Peter Kerney says progress is being made on

optimising end-user software for multithreaded operation. Intel is working with "high impact" software houses like Adobe, Cyberlink and Ulead to optimise their apps.



PERPENDICULAR HARD DRIVES SHIP AT LAST

Seagate beats the competitors on notebook drives... but the race is still on for the desktop.

Seagate has started shipping the first hard drives to use perpendicular storage technology — which lays magnetic particles on their head rather than on the side.

The first drives shipped are 2.5in notebook drives in capacities up to 160GB.

The drives only have to run at 5,400rpm to achieve the same speed as a 7,200rpm longitudinal drive, as the higher-density media allows more data to be read at a slower speed, according to Seagate Australia's Sam Zavaglia.

Seagate did not disclose its plans for 3.5in hard drive capacities, but Zavaglia said all new product-line updates

would be based on perpendicular storage. "We are not even scraping the paint off the surface," he said, in relation to disk capacities in coming years.

Zavaglia said the company was confident that platter capacity would increase fivefold within five years, but was hopeful capacity would reach as high as tenfold.

Dan Warne



The (A)PC Revolution May 1986

ATARI 1040ST BENCHTEST

"In recent months, the APC office has begun to resemble the warehouse of an IBM PC-compatible distributor — with boxes and boxes of lookalikes arriving for possible benchtesting. Occasionally, someone will unpack one, set it up on a desk, declare, 'Yes, it's a PC-compatible' and a day later put it back in its box.

"Any machine which breaks the mould of IBM compatibility, regardless of its merit, tends to generate more than its fair share of interest. One such machine, launched in June 1985, is the Atari 520ST [...] now almost a year later Atari has launched the 1040ST as a 'top of the range' machine complete with 1MB RAM and an internal 720KB disk-drive."



SPOILED FOR CHOICE

"Korea's largest computer manufacturer, Samsung, is now available in Australia. The amazing Samsung monitor in a choice of flat anti-glare screen with tilt and swivel base or standard screen and base: GR1S Composite Green 22MHz GR1F Composite green 25MHz GR2S TTL 9 pin 20MHz GR1/2S TTL/Composite switchable green 20/25MHz"

AUSSIES MISS OUT ON CHEAP ANTIVIRUS

Microsoft is offering antivirus for three PCs for US\$19.95 — but Australians can't get the deal yet, writes *Angus Kidman*.

Symantec and McAfee must be feeling spooked by Microsoft's pricing strategy for its long-awaited integrated antivirus and PC security service. But it looks like their market will be unchallenged in Australia for the time being.

Microsoft Windows OneCare Live, which combines virus detection, firewall, OS patching and backup options in a subscription service, is due for US release in July. The initial promotional price of US\$19.95 per year will increase to US\$49.95 (the latter price being similar to rival antivirus services, but Microsoft will allow up to three PCs to be protected by a single subscription, as well as enjoying the obvious marketing advantage of claiming tighter OS integration).



Whatever the price benefits and product options, it's likely Australians won't be seeing them this year. A Microsoft spokesperson said that a local release for OneCare was a "priority" but could offer no release timeframes or pricing details.

Although security products have become a lucrative niche for dedicated developers, performance flaws and bloated code in existing products leave the market potentially ripe for Microsoft.

While Microsoft could effectively close off the security market by bundling its protection services with Windows, that would open up a raft of antitrust complaints.

Nonetheless, rivals have already begun exploring alternative marketing strategies. Symantec is offering six months of free antivirus updates as part of the Google Pack software distribution service (<http://pack.google.com>).

The irony of Microsoft charging to fix security flaws in its own products has not gone unobserved. Customers "may consider Microsoft's selling of desktop security products a conflict of interest, because it developed the vulnerable software that must now be protected at additional cost," Gartner analyst Neil McDonald points out.

3G modems built in!

Notebooks belatedly enter the mobile broadband era as major manufacturers finalise plans to incorporate 3G later this year.

The rapid expansion of high-speed 3G mobile networks over the past year has made the prospect of including a built-in broadband option more realistic for mobile users, with Acer, Dell, Lenovo and Toshiba amongst the vendors with integrated 3G models due for release this year.

Bundling 3G is a more complicated issue than including dial-up modems, however, due to the proliferation of standards and the need, in many cases, to strike deals with local 3G carriers (Optus, Telstra, Three and Vodafone).

Intel's vocal support for the WiMAX mobile broadband standard may make some vendors reluctant to be seen actively supporting an alternative approach, while others may wait until HSDPA, which promises higher speeds than current 3G networks, is more widely supported by Australian carriers.

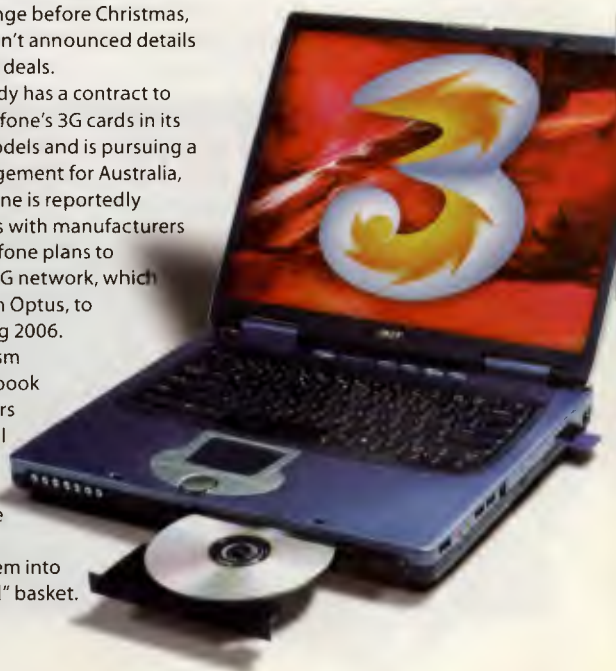
Acer and Lenovo already have a handful of 3G-equipped models on the market. Toshiba will bundle WCDMA 3G technology into its notebook range before Christmas, though it hasn't announced details of any carrier deals.

Dell already has a contract to include Vodafone's 3G cards in its European models and is pursuing a similar arrangement for Australia, while Vodafone is reportedly seeking deals with manufacturers as well. Vodafone plans to upgrade its 3G network, which is shared with Optus, to HSDPA during 2006.

Enthusiasm among notebook manufacturers isn't universal however, and some vendors have thrown the whole problem into the "too hard" basket.

HP, as one notable exception to the trend, has no current plans to build in 3G hardware.

Angus Kidman



Beating anti-P2P ISPs

Are your P2P transfers going slow? If your ISP is slowing your traffic, perhaps you need encryption, writes *Tim Gaden*.

Two BitTorrent applications, Azureus and µTorrent, have introduced encryption and cloaking technology in an attempt to beat the increasing ISP trend towards shaping peer-to-peer traffic.

Both clients offer two levels of encryption. A plain text mode provides cloaking that

doesn't bog down your CPU, but only offers minimal security. Heavier-duty RC4 encryption (the same used for SSL) encrypts the whole stream, not just the header, but uses more CPU power.

Peering traffic is on the rise as more and more people choose to download episodes of TV programs rather than watch them on free-to-air TV. Several ISPs worldwide are attempting to manage this

increased traffic by "shaping" (slowing down) the speed of such P2P transfers.

Sydney-based wireless ISP Unwired recently announced it also employs network shaping to throttle P2P activity. Unwired customers on the Whirlpool forums are furious about

congestion on Unwired's network at peak times. They suggest the shaping is an attempt to throttle back usage on a network designed for 70,000 users (but already feeling the strain with just 40,000).

BitTorrent users on other ISPs do not need to fear this kind of data-specific shaping yet. Seven large ADSL and cable ISPs contacted by APC (BigPond, Optus, iiNet, Internode, TPG, NetSpace and Westnet) all confirmed they do not shape Torrent traffic, several denying even the capability to do so, though some noted P2P is a fast-growing segment of their network traffic.

Internode and Agile MD, Simon Hackett, acknowledges that P2P is placing pressure on ISP cost structures. However, he says, "bandwidth costs in Australia are currently dropping fast enough to absorb the increasing cost, although this may not always be the case".



Cloak don't croak: ensure your latest download of *Lost* is not lost.



Do NOT read this

When you're running the web site for the President of the United States, you're bound to be handling some sensitive material. So naturally, the first thing you do is block Google from indexing parts of the White House web site. This can only be done by publishing a file called robots.txt that lists the parts of the site you don't want Google to index.

There's a teeny-tiny downside though: anyone — not just search engines — can download and read the file. Try for yourself: www.whitehouse.gov/robots.txt.

As previously reported in APC, there's also a whole online community devoted to finding out stuff people don't want you to know via Google: <http://johnny.ihackstuff.com>.

Want to peek into the Quicken accounting files of some dumb people? Easy. Browse the usernames and passwords for admin server accounts stored in plain text? No problem at all. Administrator passwords, IP addresses and Microsoft product IDs used by system administrators for remote Windows deployment? Yup.

Tim Gaden

Want to nominate a dumbest moment in tech? Send an email with the subject line "Dumbest Moments" to dwarne@apc-magazines.com.au. All correspondence becomes the property of APC.

VISTA: BUT WAIT, THERE'S EIGHT MORE!

Less than six months from its expected D-Day, Microsoft let slip that it is planning no fewer than eight different packaged versions of Windows Vista.

Of course, the software giant quickly pulled the info and claimed it was incomplete, but if you were the PR person trying to defray media attention, you'd say that. Just days later, Microsoft confirmed the official details which were, well, identical. Windows will go octal when it finally ships, though the basic product set is a sextuplet: **Windows Starter 2007** (the cut-down version of Windows for developing countries); **Windows Vista Enterprise** (for your "highly complex IT infrastructure" with

hardware-based encryption built-in); **Windows Vista Home Basic** (for when you "simply use the PC to browse the net, correspond with friends and family over email or perform basic document creation and editing tasks"); **Windows Vista Home Premium** (pay a little... or a lot... we just don't know... extra for the Aero interface, Media Center and Tablet PC capabilities); **Windows Vista Ultimate** (now with "all of the above!" including enterprise features); **Windows Vista Business** (for those who would apparently rather spend time working than maintaining

their PCs); and two offshoots — **Windows Vista Home Basic N** and **Windows Vista Business N**. (The "N" releases do not include Media Player, as stipulated by the European Commission.)

Then there are the 64-bit editions... another eight of them. While some Microsoft watchers are already bashing the Redmondians for fielding too many Vista variants, Microsoft is killing the existing Tablet PC and Media Center Edition of Windows XP by folding these features into various Vista family members.

Are there other Vista versions you'd like to see — or see axed — before Microsoft's Windows milestone ships this year? Have your say: epinions@apc-magazines.com.au.



Mary Jo Foley is the editor of Microsoft Watch (www.microsoft-watch.com). She sounds off exclusively for APC on Windows each month.

WindowsWatch

in brief



NVIDIA IN YOUR MOBILE PHONE?

Nvidia has released its GoForce 4000 GPU for mobile phones that can handle resolutions of up to 1,024 x 768 and is powerful enough to play Quake 3. While mobile phone manufacturers have been skeptical of Nvidia's ability to make a chip with low-enough power consumption, the GPU company has already signed up Kyocera. No word from Nokia, Sony-Ericsson or Motorola yet.

GMAIL FOR YOUR BUSINESS

The search giant has lifted the veil on its plan to let businesses use Gmail for all their email accounts. Currently in testing, people will be able to redirect their domain name to Google and each staff member will have Google's 2.5GB+ email boxes free of charge. An online collaborative Google calendar also rumoured could make Gmail an Outlook-killer.

NO BACKDOOR FOR VISTA

Microsoft has responded to worldwide reports of law enforcement agencies, including the UK's Home Office, requesting a backdoor be built into Vista's file system. Microsoft says it listened to the requests but will not go ahead with putting a backdoor in Windows. Some of APC's report (March, page 13) incorrectly suggested the plan was definitely going ahead.



Neighbours suffer a temporary speed drop as Peter ramps up to 156Kbit/s!



And the winner of the commemorative Wi-Fi Shed 2006 is... Peter Egan!



Who needs phone cables? Here, horsey, horsey... chew on some of this yummy "straw".



The wireless signal didn't reach as far as hoped, but was OK on the roof.

Extreme geek

Virtual broadband vigilante

Hell hath no fury like a geek separated from broadband net access.

Peter Egan of Gawler, South Australia, lives in one of Australia's most technologically advanced areas: so advanced, in fact, that it's one of a few lucky areas to have a Telstra Remote Customer Multiplexer that digitally squeezes 30 phone lines through just one line.

This breakthrough digital technology has just one small problem: it prevents ADSL from being connected to any of the residents. Another "minor" downside is that dialup won't go any faster than about 28.8Kbit/s.

Egan, who worked for Telstra for 14 years in a wide variety of roles, didn't rely on his former employer for a solution.

"What I found was that the street which ran perpendicular to my street (300m north) had copper from the exchange," he told APC. "It was not possible for me to connect to that copper, so I approached a 'neighbour' on the corner of my street who did have access to that copper. By striking a deal with him, I was able to get ADSL installed at his premises and use an 802.11b access point and external antenna to get connected remotely to the 1.5Mbit/256Kbit ADSL service."

"The service has been working now for 18 months — we have four neighbours sharing the connection who wouldn't otherwise have access to broadband."

Even though Peter once worked on Telstra's inter-capital network links, he confesses that personally setting up a long-range suburban wireless network wasn't straightforward, but his main issue is his addiction to tinkering. "I keep locking up the router by constantly changing settings to see what works best..." We checked, and can confirm that that is a certified sign of being an Extreme Geek. Peter can be heard mumbling in his sleep, "must change one more setting..."

Peter now works on making digital photo frames out of old eBay laptops and selling them to friends for slideshows at barbecues.

Dan Warne



HOW GEEKY ARE YOU?

Have you wired up your car? Shared your home media library with five family members in three states? Made a 16 terabyte file server? If you've done something interesting with computing technology, APC wants to hear about it.

Email a description of your project to dwarne@apcmagazines.com.au and include photos (we need at least one of you pictured with your gear).

This month's Extreme Geek wins a Logitech Cordless Desktop S-510 keyboard, a perfect match for

today's flatscreen systems. Its innovative ultra-flat design is amazingly comfortable. Integrated one-touch media and net controls include a music "Shuffle" key, image rotate and zooming. An advanced optical mouse with Tilt Wheel delivers fast performance and freedom of movement.



The new Coolpix P Series with wireless image transfer

The Nikon Coolpix is more than your everyday camera. With a range of easy-to-use features, it helps you take better pictures, more easily. And the new 8MP P1 and 5MP P2 with Wi-Fi technology let you transfer each image to your computer or printer, wirelessly. So nothing will get in the way of a great shot.



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More Fun, More Freedom



quote file

“Vista would have been out nine months ago if we hadn’t had to do all the security design reviews and put the security features in XP SP2”

Bill Gates speaking to FT.com. The OS programming industry just ain’t what it used to be since everyone started griping about security holes. . .

GPS+Google Earth = a running map of your travels

What do you get when you combine health nuts and hackers?
A supercheap GPS tracking system.

All you need is a wrist-mounted GPS Personal Training Device, such as the Garmin Forerunner 201 (\$269 from www.ja-gps.com.au) and nifty free software called Running Logs for Google Maps (<http://dave.runningland.com/grunninglogs/>).

The wristwatch receives satellite global

positioning signals and stores the results in XML. Garmin’s gadgets automatically export your physical progress: latitudes, longitudes, altitudes, times (and calories burned) once you get home. Running Logs for Google Maps loads the XML, and creates a Google Earth KML file so you can “see” your progress plotted on satellite photography. Not only do you get a line on a photographic map indicating where you went, it plots the line in front of your eyes to show you how fast you went there.

The software even has legit features for health nuts, like different colours when you speed up or slow down, distance markers, and the ability to log — and therefore track — your progress over successive jaunts. The included web template already allows blogging joggers (yes, they exist) to publish the day’s run

SPLAT GOES GPS

The producers of *World’s Greatest Police Chases* will be dismayed to discover the LA police department is stealing its thunder by trialling GPS tracking devices designed to avoid dangerous high-speed chases.

The device consists of a battery and radio transmitter embedded in an epoxy compound, and is designed to be fired at, and to stick to, a fleeing vehicle. Activating on impact, the device employs a wireless modem to relay positioning information back to police via a web site.

in satellite sharpness online. The same tracking devices and software could be used to create an Indiana Jones-style map for your holiday blog, or a blow-by-blow map of your buck’s night — if it’s your memory, not your legs, that needs jogging.

Jeanne-Vida Douglas



DREAM SYSTEM

Whiskey PC

By squeezing a home server into a 1.5 litre Ballantine’s Whiskey bottle, Janos Martin has created a high-spirited mod that looks as good in the pool room as it does in the study.

Janos has managed to distil an Intel P3 733EB processor, a 256MB stick of notebook RAM, a 40GB notebook HDD and a 60W mini-ITX PSU into the confined space. The modding process wasn’t trouble-free, however — after assembly, excessive heat left the idea on the rocks. But Janos refused to let that scotch his plans and installed a graphics card fan into the neck of the bottle. Neat!

He is now embarking on the intoxicating project of creating a cluster of these computers in his living room. The more the merrier. . . hic!

Read all about it at <http://snipurl.com/mcc0>.

Dan Warne





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unveils technology smorgasbord

Under intense pressure from AMD, Intel strives to retake the initiative in driving PC technology. *Dan Warne* reports from IDF in San Francisco.

It rankles Intel that AMD has made big inroads into its market — particularly into Intel's most profitable business, server CPUs. "Obviously, we should never have been in this situation," said Intel senior executive Pat Gelsinger, speaking at the Intel Developer Forum in San Francisco. "We clearly have the manufacturing and design prowess. Competitively we should

be dramatically ahead." Last year, time and again, AMD's Opteron server CPU proved faster and more power-efficient than Intel's Xeon. So at IDF last month, Intel made a number of significant announcements in an attempt to take the lead in all areas of PC technology.

A NEW CHIP ARCHITECTURE

Intel has finally dumped the ageing "NetBurst" architecture which

formed the basis of most of its CPUs — beginning with Pentium Pro and ending with Pentium 4. The architecture had been pushed to its limit, with the PC industry battling high power consumption and heat-output problems.

The new "Core" architecture, which will form the basis of all Intel's notebook, server and desktop CPU releases from now on, is an evolution of the low clock-speed, low power Pentium M architecture. Importantly, it's full 64-bit, so uptake of Windows Vista 64-bit will be much higher than uptake of Windows XP x64. Device manufacturers are now under pressure to come up with 64-bit drivers.

Every chip based on Core architecture will be multicore. (Confusingly, the recently released "Core Solo" and "Core Duo" chips are not based on the Core architecture.)

Core architecture has a "wider instruction pipeline" than NetBurst — each core can process four instructions at once, compared to three in NetBurst.

Meanwhile, multimedia processing gets a boost too: the 128-bit SSE instructions used by video and audio tasks can now be executed in a one-clock cycle (instead of two).

DESKTOP GOES QUAD-CORE

Here's the news PC users have been waiting for: desktop processors are about to go quad-core. Little is known so far about the Kentsfield chip other than that it provides eight virtual cores through hyperthreading. One thing's for sure though: any software developer who isn't scrambling to optimise their software for multithreading is nuts: their software will run slower than any competitors' that has been optimised. Kentsfield will be preceded by Conroe, which is a dual-core chip based on the Core architecture.

FASTER NOTEBOOK CPUs

Merom will be the dual-core notebook processor based on the Core architecture. It has a whopping 4MB of L2 cache built in (twice that in a Core Duo) and cache size for each processor is dynamically scaled up and down. Intel claims 20 per cent better performance, with the same power consumption as Core Duo T2600.

PC BOOTING IN A FLASH

"We need to have devices that boot very, very rapidly — the same way that we get off the plane and immediately get a cell phone signal," says Sean Maloney,



Straight to the pool room: except for the quad-core server chip which we need for, um, testing.

Intel powerbrokers: chief technology officer Justin Rattner, mobility chief Mooly Eden and enterprise chief Pat Gelsinger (left to right).



Small fry: yes, that is a whole, fully-functional PC in an "ultra-mobile" form factor.

executive vice president and general manager of mobility platforms. His solution: 256MB or more of flash memory embedded directly into the laptop's motherboard (used for caching OS startup files as well as commonly used apps). In on-stage demonstrations, Intel showed how it can make a PC boot twice as fast and load a batch of applications straight after boot five times as fast.

"It always amazes me that people aren't more focused on the slow speed of hard drives," chief technology officer Justin Rattner told APC. "We have these incredible speed boosts in central processor technology on a regular basis, but hard drives are the perpetual bottleneck in a system."

And is there any conflict with the hybrid flash/hard drive technology developed by

Samsung? Vice president and mobility general manager Mooly Eden jokes: "no conflict... they have our technology and we have ours, and they are in direct competition with each other... I don't see any conflict!" On a more serious note, he says he believes the PC industry will prefer an integrated solution over one that is tied to a particular brand of hard drive.

MICROSOFT'S BOMBSHELL

Intel is hoping the PC industry will give the 20-year-old PC BIOS the flick and move to the Extensible Firmware Interface (EFI) which allows much more flexible booting. Apple's adoption of EFI for Intel-based Macs gave the rest of the industry a reason to look up and take notice, but it was Microsoft's promise to support

EFI booting in Windows Vista that made the industry seriously consider switching to it.

Subsequently, Microsoft dropped the bombshell at IDF that it had decided not to support EFI booting until a "future release of Windows" (and even then, it will only be for 64-bit CPUs). So all those Intel Mac owners (which use 32-bit CPUs — Intel does not currently have a 64-bit desktop processor) will be disappointed to learn their Macs will never be able to run Windows Vista "officially".

WHY YOU NEED DUAL-CORE™

Intel didn't win itself any friends when it struck a marketing deal with Skype and claimed that Skype's new 10-person conference calling capability

was reliant on Intel Core Duo processors. Of course, as soon as someone figured out how to disable the artificial limitation, it worked fine on AMD as well.

But one apparently legitimate reason for dual-core is HD-DVD playback. At IDF, Intel was demoing a Toshiba laptop playing back a sampler HD-DVD (and believe us when we say the picture was crisp) that was using more than 50 per cent processor utilisation on each core. "You need Core Duo for HD-DVD playback," the bubbly PR proclaimed. (But, is that Core Duo, or dual-core?)

HARDWARE VOIP

Intel has created a PCI card — to ship with some of its desktop motherboards — that will allow you to plug a standard analogue telephone into the back of your PC and dial through your VoIP software like Skype. It says the PCI-card design



UMPC 2.0: coming in 2007, considerably smaller and slimmer than first-gen UMPCs.



WE NEED DEVICES TO BOOT RAPIDLY — IMMEDIATELY, LIKE A CELL PHONE SIGNAL

INTEL'S NEW TECH AT A GLANCE

Intel's infuriating codename scheme for its components keeps even the most avid observers confused. Here's a quick guide to the latest technologies announced and their codenames:

Core: Intel's new low-power multicore chip architecture that will be used for all future processor releases. (The Core Solo and Core Duo CPUs are confusingly *not* based on Core.)

Conroe: upcoming dual-core processor for desktop PCs.

Kentsfield: upcoming quad-

core processor for desktop PCs.

Merom: upcoming dual-core processor for notebooks.

Napa: due out sometime after June this year, an update to the current Yonah (Core Duo) platform that will include the Merom CPU.

Kedron: upcoming Wi-Fi chip that will also support 802.11n.

Crestline: upcoming chipset that will include an integrated graphics chip powerful enough to support Vista Aero Glass.

Robson (pictured left): a flash-memory board for PCs that will halve boot and sleep-waking time, as well as accelerating application load.

Santa Rosa: the 2007 PC platform that will combine the Merom CPU, the Kedron wireless chip and Robson flash memory.

Silverton: experimental PC platform where the whole PC motherboard can be switched off while the display remains visible (but frozen).

will be available for other manufacturers. Intel is also pushing manufacturers to use array mics in notebooks and monitors.

MOBILE WIMAX READY TO ROLL

Even though the standard for mobile WiMAX was only finalised in December, Intel has already been able to make a PCMCIA card based on it. It demonstrated a scooter fitted with WiMAX and a webcam that was able to transmit a full-frame-rate video feed. Of course, all of that means squat until the networks are available, but Australia does have a head start with Sydney (and soon Melbourne) wireless ISP Unwired receiving \$37.5 million funding from Intel to migrate from its proprietary wireless system to WiMAX.

802.11n STILL A WHILE OFF

For everyone hanging out for more reliable wireless networking than 802.11g, don't hold your breath. The next-gen Wi-Fi standard, 802.11n, is yet to be standardised and Intel isn't putting a release date on it (other than 2007, when its Santa Rosa platform is released).

When APC asked if Intel would use the same impossibly inflated throughput figures used for 802.11g, enterprise technology chief Pat Gelsinger said, "I don't know... but what I can tell you is that with 802.11n, because it bounces signals around obstacles, throughput will be much more consistent as you move away from the transmitter than 11g, where speed drops away quite quickly."

VIVTRINO

Journalists asking that elusive question, "what is Viiv, exactly?," discovered at IDF that — more than anything else — it is a certification program for PCs, networking devices and external storage. Think of it as Centrino — for all the stuff that connects together at home. (See our Viiv feature on page 20.)

POWERLINE NETWORKING JOLT

One of the ways Intel wants to simplify networking is to pump data through your PC's power cord. Remember HomePlug, the in-home networking technology that uses the electrical wiring in your house for networking? You probably also remember that the adaptors have always been so

expensive and slow that it simply wasn't worth it.

Intel has recently bought into the technology and is pushing towards making HomePlug hardware more affordable by getting multiple manufacturers to make it. The new HomePlug AV specification will move data at 200Mbit/s.

Intel says the next step will be to build HomePlug into home theatre PCs, so you can get wireline networking reliability without having to string ethernet cables round your lounge room.

GYROSCOPIC REMOTE CONTROLS

Intel also demoed a remote control for media centre PCs that uses gyroscopes internally to allow you

Antenna overload: Intel admits it is proving challenging to fit Wi-Fi, WiMAX, 3G and ultrawideband antennas into notebooks.

Now for the PDA-phone-PC: This ASUS unit has an inbuilt webcam for high-quality video chat.



Cattle class: Intel couldn't fix airline seats, so it fixed notebook design.

to control the mouse pointer on-screen — by moving the remote. Finally, that guy from the famous tech support story who was waving the mouse in the air — and couldn't figure out why the mouse pointer wasn't moving — will have the input device of his dreams. The remote also allowed for voice control of the PC, despite the fact that people have never really warmed to the idea.

TIMESHIFTING BECOMES PLACESHIFTING

Part of the Viiv platform is "Media Share" technology. Intel says this is software that will allow you to record your favourite TV shows on your home PC automatically and then watch them on your laptop wherever you have a broadband internet connection. Digital entertainment chief Don McDonald also said the company was looking at Viiv certification for mobile devices including phones — which hopefully means mobile phone companies will provide improved file-transfer systems for getting files on and off mobile phones.

UDI (OR "YET ANOTHER DISPLAY INTERFACE")

First you loved VGA. Then you were wowed by DVI. Now, just when you thought things couldn't get better with HDMI, Intel announces another exciting evolution of the display connector: UDI. The exciting new Universal Display Interface apparently has few obvious differences from HDMI, but it doesn't carry the sound signal, and Intel claims it has some optimisations for PC display modes. It also has a different plug shape.

WIRELESS USB AIN'T WIRELESS USB

Various companies have released wireless USB products, but they typically require a specific transmitter to be attached to your PC. Intel has announced a "certified wireless USB" standard which is touted to provide up to 480Mbit/s within three metres of your PC and 110Mbit/s at up to 10 metres. It uses ultrawideband radio technology, but no-one at Intel seems quite sure when it will be approved for use in Australia.

"You know, that's a good question... we're working on approvals in the US, Europe, Japan... but Australia... yeahhhh." APC will investigate and report back.

GHOST IN THE MACHINE

Intel demonstrated an experimental power-saving PC platform, codenamed "Silverton", that will allow a PC's motherboard to be switched off altogether while the PC's display remains on (but frozen). Chief technology officer Justin Rattner disconnected the video interface cable from a prototype motherboard to demonstrate how the screen remains live. The whole PC only used 1W of power in this mode compared to 6.5W in full power or 3.5W with energy saving. There are some rather obvious downsides for the animated screensaver industry, but the benefits for notebook battery life could be great if the motherboard could be switched off the instant a user stops actively using the PC. **END**

SEXY PC DESIGN CONCEPTS

Intel's concept PCs haven't always been cool. Often they've been awkward FrankenPCs to which neither users nor PC makers have warmed. But the latest concept PCs, ultra-mobiles, attracted huge attention. They're full PCs that can run Windows XP Tablet PC Edition (or Vista when it's released) in a case about the size of an A5 paperback book. The first-generation design has a rectangular case about 3cm thick, includes a 7in LCD display with 800 x 480 resolution, a 60GB hard drive, 256-512MB memory, a Pentium M processor, USB, an SDIO memory/expansion card slot, Wi-Fi and Bluetooth. They're in production with ASUS, Samsung and others.

A second-generation UMPC due for release in 2007 is considerably slimmer — more like a large PDA — and twists open to reveal a keyboard on the lower layer. However, current prototypes use notebook chipsets and achieve only 15 minutes battery life. Intel is waiting on the

completion of ultra-low-voltage chips to see if it can eke enough battery life out of the device.

Intel also showed concept notebook designs. One, designed for people who use notebooks on planes a lot and encounter "economy class reclining seat syndrome", allows the screen to be lifted and brought forward on a stalk — while still allowing the keyboard to be used underneath it (see left).

Another design was a notebook with a screen on rails that could be shunted from the back of the keyboard to the front (ideal for watching movies in bed, or giving presentations to small groups), then flopped down and used as a tablet. The whole notebook could then be docked into a freestanding shelf with speakers on either side that allowed the notebook to be used as a TV, or as what looks like a desktop PC.

Dan Warne travelled to San Francisco as a guest of Intel.

iPod killer? No, but UMPCs make ideal media players, complete with flip-out stand.



Lock 'n' load: slot this laptop into a speaker dock and you can use it as an LCD TV.



Intel pitches the HTPC that "just works"

PC-based home theatre promises a lot but until now hasn't quite delivered. Will Intel Viiv change all that? *Dan Warne* investigates.

When HTPCs were hot eighteen months ago, promises of lounge-room nirvana came thick and fast. We'd have wireless video streaming around the home. It'd be possible to control your PC from the lounge via remote control with a "10-foot interface". Recording an entire series of your favourite TV show would be as simple as selecting the name of the series and the PC would do the rest.

Of course, as many early adopters found out, the reality didn't live up to the promise at all.

Videos often stuttered and broke up over wireless networks. Digital media extender boxes often had

limited video codec support. There were no legal movie-download services. PCs could be switched off by remote control, but often couldn't be switched back on.

Windows Media Center's "10-foot interface" was great unless you had to go into a control panel to change something, or use Internet Explorer to access the web via your TV — in which case it was a kneel-in-front-of-your-TV-and-squint interface.

And, Microsoft Australia couldn't find the fortitude within its ranks to sort out a solution to the lack of an official TV electronic program guide here (though there is a practical though unofficial version

from IceTV).

Finally, most of us didn't warm to the idea of putting a dowdy desktop tower under our shiny silver TV.

Now Intel is painting its "Viiv" (rhymes with AMD "Live") platform as the white knight for the home theatre PC movement. The package of software, hardware, marketing and content that is going to make the digital home "just work" — just like the iPod.

PC enthusiasts have spent decades mocking Apple Computer and its tightly controlled computing platforms. But no-one argues that the rampant success of the iPod is tied to an ecosystem that works for buying,

downloading, syncing and playing.

The end result is that Apple has a stranglehold on the digital music player market — which is now powerfully cemented and difficult to break into — thanks to a platform of software, hardware, the world's biggest online music store and accessories that only work with iPod.

There's a lot to be learned from that business model. The slow take-up of home theatre PCs provides an excellent test case for the "iPodification" of a new segment in the industry.

WHAT VIIV IS (AND ISN'T)

Nothing in Viiv is completely new technology, admits Don McDonald, Intel's digital home boss.

"But Bluetooth headsets and mobile phones were all based on existing industry standards too," he said. "And look how many problems there were in getting different brands



SLOW TAKE-UP OF HOME THEATRE PCs IS AN EXCELLENT TEST CASE FOR THE "IPODIFICATION" OF A NEW SEGMENT



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TOSHIBA

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David Stratton (far right) likes Viiv so it can't be all bad. Also pictured, from left, Don McDonald (Intel's digital home chief), Philip Cronin (MD, Intel Australia), Clive Mayhew (MP3.com.au) and Justin Milne (MD, BigPond).



to connect properly."

Viiv is a package of standards that Intel is enforcing. If hardware makers meet the standards and complete Intel's testing successfully, they can slap a "Viiv" sticker on the front, which, to the end user, stands for "works perfectly with other Viiv devices".

For example, if you buy a Viiv PC and a Viiv-compliant wireless router, they will connect to each other automatically and securely with a click of the mouse button. The most you'll have to do is choose a four-digit pin.

If you buy a Viiv-compliant digital media player, it will be guaranteed to play movies streamed from your PC over your home network. Intel has made it ultra-simple for set-top box makers: they just have to be able

to decode MPEG-2. That's because a Viiv PC running Intel's Viiv software stack will transcode all video files on-the-fly to MPEG-2 video which is then streamed over the network.

Unfortunately, both of those capabilities are "coming soon" in the second half of this year — when Intel launches the Viiv 1.5 specification. All that Intel has launched so far is the Viiv PC platform.

PROTECTION MONEY

Of course, Intel isn't pushing Viiv for the love of the industry — it's out to make a buck. Although the Viiv platform may be based on standards, you still have to buy Intel's branded implementation of those standards, ie. an Intel dual-core CPU, Intel-brand

motherboard chipset, Intel network chip, Intel digital-home Southbridge, the list goes on (see below).

You also can't build a Viiv PC: you have to buy it complete from a PC maker, because part of the Viiv specification is Windows Media Center, and that isn't available to anyone except system builders.

Caveats aside, a PC bearing the Viiv badge will have enough processing power to transcode media on-the-fly for live playback to multiple endpoints (such as digital media adaptors) over a network, as well as supporting surround sound and instant PC suspend/resume.

LEGAL DOWNLOADS

Intel says it doesn't plan to stop

people playing pirated movies and TV shows on the Viiv platform, but points out that "the goal here is to make content easier to buy than it is to pirate".

To that end, Intel has done the hard work of signing up content suppliers around the world to the Viiv platform. It's what Microsoft never quite did after building the Media Center software platform.

Viiv has launched with Quickflix, a DVD-by-mail company which has evolved into a digital downloads provider offering integration with Windows Media Center's menu system. BigPond Movies has also stated its intention to support Viiv, but it hadn't become Viiv-compliant by the time Intel

THE TECH BEHIND Viiv

VIIV-COMPLIANT PC

Dual-core CPU: either Pentium D or Core Duo (Intel does also allow its "Extremely Expensive" Pentium 4 EE).
Motherboard chipset: Intel 945 Express, 955X Express or 975X Express.

Special Southbridge: Intel ICH7-DH or ICH7 MDH (the "DH" stands for "Digital Home") that supports Instant On/Off and Intel Matrix Storage (known elsewhere in the industry as RAID).

Networking: Intel PRO/1000 PM or PRO/100 VE/VM network chip.
Sound: either 5.1 or 7.1 surround sound support.
Notably absent: any TV tuner or graphics card minimum requirements.

SOFTWARE

Windows XP Media Center 2005 Rollup 2.
Intel Media Shell software: handles the automatic connection of wireless routers and network media adaptors.
Drivers: Intel Quick Resume Technology Drivers that allow you to switch your PC on/off via remote control nearly instantly (requires a QRTD-compatible BIOS).

WIRELESS ROUTER

A Viiv-compliant wireless router supports standards that allow a Viiv PC

to connect and automatically set up wireless security settings etc. Shown left is the Linksys RT54GS, the model that Intel has been using to demo Viiv and which is already on sale (though it's not yet officially Viiv-compliant).

DIGITAL MEDIA ADAPTOR

A Viiv-compliant digital media adaptor will be able to access the PC's movie and sound files over the network with a media-centre-like menu system on your TV. It will then decode streaming MPEG-2 from the Viiv PC. Shown here is the Pinnacle

ShowCenter 200, Intel's chosen demo unit which is expected to receive Viiv certification.

COMING SOON?

At the Intel Developer Forum in San Francisco, digital media chief Don McDonald said Intel was looking at specs for Viiv-compliant mobile phones and portable media players. We hope so — these are a category of products that sorely need to be made to "just work" when it comes to digital media.



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like.no.other

SONY



LinuxWindow

Linux, impossible to ignore

Matt Overington covers the growing presence of Linux in a Windows world — and the resultant integration issues.

The days of the “us and them” mentality are over. System admins and power users can no longer afford to wage idealistic wars on anyone that decides to run an OS other than Windows. When I first started to tinker with Linux over 10 years ago, it was largely considered a geek toy — but Linux is now an increasingly important tool in any successful system admin’s kit.

Companies like IBM, SUSE and Red Hat have gone on to prove that you can make serious money by embracing Linux. Even Microsoft has its very own Linux lab.

Fact is, it’s becoming easier and easier to integrate a Linux system onto a Windows network. Apps like Samba have matured and allow Windows and Linux to happily coexist on the same network. It won’t be long before Samba supports Active Directory; a huge leap forward. Companies like IBM and SUSE invest heavily in Linux and its marketing, to tout the benefits of Linux solutions.

BUSINESS ADVV

Linux has a role to play in the small to medium business sphere as well as the enterprise arena. The LAMP stack — comprising Linux, Apache, MySQL and either Perl or PHP — is extremely popular as an entirely open source web server and big business is starting to stand up and take notice. Oracle recently announced a free version of its database software; and both Microsoft and IBM are attempting to woo young developers away from Linux.

Another sign that Linux is to be taken seriously is Linus Torvalds’ refusal to comply with version 3 of the GNU Public License (GPL3). Torvalds argues that DRM is actually a feature favoured by businesses to prevent data theft — not just something for record companies to stop teenagers pirating music. It’s this sort of maturity that’s going to see Linux hit the big time — not by steadfastly sticking to the ideals of a few free-software zealots.

TRICKLE-DOWN

Consumer applications are migrating to Linux as well. Skype has revolutionised VoIP telephony. While the company has a heavy consumer focus, this hasn’t stopped it from focusing equally on Windows, Mac and Linux platforms. (And the Linux version operates just like the others.) Likewise OpenOffice, which offers an extremely solid Linux build of its Microsoft Office-compatible software suite.

Tux’ll fix it: Linux has a new set of tools to use in the form of **Windows compatibility**.



Linux distributions have also become more user-friendly; many Linux providers now offer the ability to try the OS without interfering with the hard disk and committing to replacing Windows entirely. The leader in this category is arguably Ubuntu, cleverly available in two flavours — a disc-based “Live” version to allow users to experiment with the OS, and a permanent installation version. With modern hardware, slick installs, partitioning support and a rich suite of apps, it’s little wonder the Debian-based distro has managed to gain a dedicated following on the desktop.

FEAR, UNCERTAINTY AND DOUBT

Microsoft loves to cite support as one of the big benefits of paying for commercial software. If something goes wrong, there’s

someone on the end of the phone to help you out. Microsoft claims Linux offers less accountability and support — there’s no army of call-centre staff on hand to troubleshoot any issues. While this is true of community-driven open-source distributions like Debian, every serious Linux player (eg. SUSE, Red Hat etc.) offer comprehensive service and support packages. Even community-run distributions have enormous and active online support forums; maybe not ideal for big businesses but adequate for home users. That’s the beauty of Linux: anyone that needs comprehensive support can pay for it — but the little guys like you and me can just grab a distro and get cracking. And given these now work side-by-side Windows, surely it’s time to focus on productivity, not the OS underneath. **BTB**



by
Matt Overington

Matt Overington is an operating systems specialist and former technical editor of APC. He specialises in the interaction between Linux and Windows systems.

HastaLaVista



Migratory patterns

With Vista just around the corner, I thought I'd take a look at some of its tools to help both users and admins perform a successful migration from Windows XP.

WINDOWS TRANSFER
Recently I was involved in a reasonably large roll-over of new hardware, and our weapon of choice for migrating users was the humble XP Files and Settings Transfer Wizard via a network share.

Windows Vista comes bundled with a new flavour of wizard called Windows Transfer. The first notable difference is that you initiate the transfer from the new Vista PC, rather than the old XP machine. Upon launching the wizard, it asks you whether this is the new or old computer, and which location you wish to use to store the migrated data. This can be a USB/external device, local share, network share or writable CD/DVD. As it's the new machine, it copies the Windows Transfer executables to the specified area, and then waits for the old machine to connect.

From the old machine, you run the application and you can select to automatically connect to the new machine if they're on the same network — if they can connect, the new machine displays that connection on screen. You then get the option of what you wish to transfer — files and program settings for all users or just the account you're logged on as. You can also choose a Custom transfer.

The Custom options are essentially the same as the XP version. Then, the Vista PC looks at the user data it gathered and asks which existing user accounts it should map the old ones too. You don't need the new user account ready to migrate data into, but can simply specify that the old one should be created on the fly. You then get a summary of what will be transferred.

USMT

While Windows Transfer is more flexible and scalable than the old transfer wizard and will certainly prove to be a useful tool for those one-off migrations (or backups, even), it's not going to be the basis of a large-scale migration. For that, Vista comes with the User State Migration Tool (USMT) 3.0.

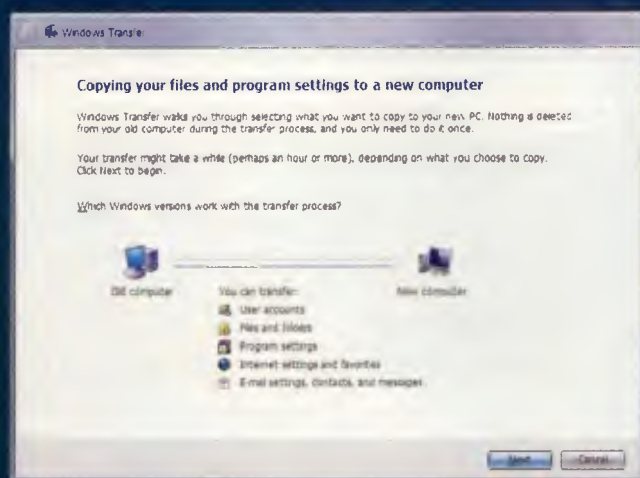
USMT performs in the same way as the previous version (2.6), by collecting user, system and application data. Unlike 2.6, it makes use of scripted XML files rather than INF. This makes it extremely easy to customise which data gets migrated. The scanstate and loadstate commands that migrate user data follow a default backup behaviour which is easily altered by creating a custom XML script and calling it when launching the application.

For example, if you create an XML script to scan a user's hard drive and backup all MP3s called mp3backup.xml, you can call it by loading "scanstate /i:mp3backup.xml". Restore the data using "loadstate /i:mp3backup.xml". The same is applicable for file or folder exclusions — simply create the appropriate config.xml file and call it in the USMT command. The beauty of these scripts is that the commands can be customised for each user or user group based on their needs — and distributed against their network accounts.

USMT 3.0 no longer supports migration from Windows 95, 98, ME or NT, and it won't restore files to Windows 2000 or below. Seems MS is pushing Vista all the way. . .

MIGRATE OR BE DAMNED

It's good to be able to get a feel for these tools ahead of time. The Windows Transfer utility, while fairly lightweight compared to USMT, still has its place. It's going to be very useful for one-off user migrations and would even be appropriate for a full user migration for small businesses who don't have the resources to dedicate to customising XML scripts. It's probably a better tool than USMT in some ways. The ability to tailor each migration to the user's specific needs while you have the old computer and the new one side-by-side makes life much simpler. The only downside to this approach is that each migration takes substantially longer, so it will ultimately be a compromise between efficiency and thoroughness. After all, IT administrators like quick and painless tasks, while users prefer reassurance. Luckily, it seems that Vista will come with the tools to satisfy everyone's needs. **APC**



Windows Transfer's functionality is great for one-off user migrations.

James Bannan is a systems manager at St Leonard's College (Vic) and APC's resident Windows expert. He'll be checking out Vista for you every month.

by
James Bannan



END USER

APC readers — who deal with new computer users — share their survival stories. And so do new users who deal with geeks.

David M. Williams, national IT manager for a recruitment company, couldn't contain himself. He emailed us, saying: "You want stories of how clueless end users are? Sadly, I have millions."

WHAT'S A BACKSLASH?

End users don't have a clue about the existence of the backslash (\). I've lost count of the number of times I told people to type "backslash backslash server", only to hear them tell me it didn't work — then I find out they used forward slashes. So, I changed my spiel: "Now, click Start, Run, type backslash backslash server — that's backslash, not forward slash, it's above the enter key". Every single time without fail they say "yes, yes". Every single time without fail they say it didn't work, then discover they used forward slash. FFS!

RECALLING EMAILS

Another peeve is the number of people who ask me how to recall a message they've sent. I ask if it was to someone

outside the company. They say yes.

I tell them they can't. They get upset.

"Oh, but Outlook at my old company let me". I then try to explain that it didn't, it was just a stupid menu option that shouldn't be there because it makes people think it does something when all it does is send out another e-mail saying you'd like to retract the first one.

WWW IN FRONT OF EVERYTHING

What's with the "www" obsession?

"What's our intranet?" they ask. I

say: "type http colon slash slash

intranet". "It doesn't work," they tell me.

After some effort I realise they typed

"http://www.intranet". At least I guess

they didn't type "http://www.intranet.

com" — then again, that page probably

would bring up something and hopefully amuse them for a little while.

DUMB TECHIE

I guess I should be fair — it's not always end users who are stupid. A lot of techs are in the wrong field. I think I could count on one hand the number of computers I have worked on — set up by someone else — which had all the regional settings options set to "English (Australia)". Yes, Microsoft suck for making it something you have to set in three places, but what sort of lazy or ignorant (or both) people are setting up computers? The same ones, I guess, who then whinge, "Oh, Bill Gates always wants to force people to use US English spelling in Word".

WIN!

David and Jon each win a cool Rocks portable NXT MP3 audio case from ANYWARE COMPUTER ACCESSORIES.

This is suitable for use with a variety of audio devices including MP3 players, iPod, MD, CD and FM radio. The case features an integrated speaker which utilises NXT flat panel

loudspeaker technology for optimum sound quality. The case is self-powered using AAA batteries (not included). The audio case is ideal for music listeners who want to enjoy their music without using headphones.

More info at www.anyware.com.au or call 1300 ANYWARE — 1300 269 927.



Jon Wendes of East Davenport, Tasmania, is a technician with a major electrical retailer. Here he recounts when a customer brought in her Acer tower — complaining it wouldn't boot Windows.



Having paid \$2,000 for the system — just the week before — she was almost in tears. She had earlier loaded her entire collection of family digital happy snaps onto the hard drive, along with her children's homework. She was sure they'd all been lost forever.

I was busy in the tech bay when she arrived, so a sales person booked the system in for me to

look at. The book-in sheet had the customer's description of the problem, which read: "System won't start. Screen reads 'Invalid System Disk. Replace the disk and press any key.'"

The sales person had added the note: "The hard drive has crashed, I have advised the customer that you will need to perform a full system recovery — and that all her data has

been lost." I just love it when sales staff do my job!

When I had a look, I found a floppy disc was in the A drive and the BIOS was set to boot from the A drive first. I ejected the disc and presto — the machine booted up as normal.

I then rang the customer to let her know the good news. So, the truth is that some sales staff are just as likely as customers to have no idea.



You want value for money without compromising on features?

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brother

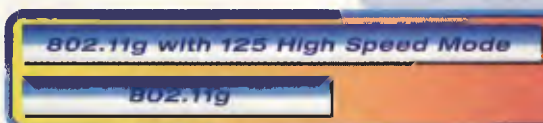
Triple Coverage Range and Boost Data Throughput by 350%

ASUS recently introduced the WL-550gE wireless router and WL-100gE wireless card, which significantly improved the signal coverage range and data transfer speeds of the 802.11g standard. Wireless freedom and convenient information sharing is no longer just a dream ...

Broad Range (Encore) Technology



Broad Range (Encore) Technology and High Power Support enhance coverage area of 802.11g by 300%



Fast enough for complex multimedia Content

The ASUS solutions, with 125* High-Speed Mode, boosts data transfer speed of the 802.11g standard (54mbps data transfer by 35% while remaining compatible with any 802.11g devices. For users who handle complex multimedia applications and demand fast data throughput for large file sharing, they are the exact solutions needed to attain wireless freedom without sacrificing productivity expanded signal coverage, building wireless networks now require fewer routers, wires and cables, meaning lower cost and a cleaner wireless environment.

For maximum data throughput and signal coverage made possible by ASUS engineering capability, the company strongly recommends you to team the WL-550gE with the WL-100gE wireless card. Other excellent solutions with Broad Range technology include the WL-169gE USB adapter and WL-138gE PCI card. With such advanced technologies now available, it's time for you to seriously consider unwiring your work and home networks through ASUS wireless solutions.

WL-550gE wireless router enhances coverage range and transfer speed by 300% and 35% respectively.

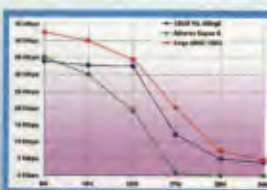


ASUS offers two other wireless adapters with Broad Range (Encore) Support:



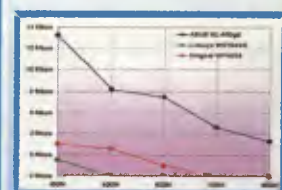
Utilize the WL-100gE to equip the client side and the whole network with Broad Range (Encore) and 125* High-Speed Mode.

Indoor Throughput Comparison



With Broad Range Technology and Output Power Control, WL-550gE enables stronger signal than standard super G.

Outdoor Throughput Comparison



By adjusting output power, WL-550gE provides larger coverage - even larger than MIMO !!



Intel loses a fan

The problem was obvious: the CPU fan had burned out. But when APC reader David Field tried to return it, Intel wanted the CPU back as well.

Dan Warner investigates.

Dear Watchdog,

One of my client's computers started locking up and shutting itself down recently — and I tracked it down to a faulty fan on the Intel Celeron CPU.

Fortunately I had a spare fan in stock, so I was able to swap it out quickly.

But, when I tried to return the faulty one I was advised that Intel's policy is that a functional CPU must be sent back with the faulty fan in order to get a new fan. That means my client would have had

extended downtime. Naturally, I chose not to do this — I simply bore the cost of the CPU fan myself in the name of good customer service.

It seems ridiculous that I am expected to send back the \$300 working part with the \$20 non-working part to get the \$20 part replaced.

Can Watchdog get Intel to explain why this policy is necessary?

*David Field
Door 2 Door Computers
Port Macquarie, NSW*



Intel communication manager Daniel Anderson said that it was unfortunate that David's dealer hadn't contacted Intel Australia directly for assistance. "Intel's return and replacement policy is designed to help track issues and prevent fraud. Customers

with specific urgent requests should contact their dealer to discuss their particular issue. In some cases, immediate fan replacements can be made without CPUs — based on urgency and where part numbers can be supplied," he said.

Is there an echo in this eBay chamber?

Dear Watchdog,

I won and paid for an iPod on eBay for \$255 — from a seller with an impeccable 100% rating (from around 100 previous transactions), but it turned out her account had been hijacked and I had been defrauded.

Getting a refund from eBay under the "buyer protection program" has been a travesty in evasive customer service. I've had templated responses from them over and over again and "live chat" operators who seem unable to do anything. Two months later I'm still waiting.

*Ben Waugh
Gold Coast, Qld*

APC contacted eBay Australia spokesman Daniel Feiler and asked him to look in to this. We received this reply.

Dear Watchdog,

Thank you for bringing this matter to my attention. It is always regretful to hear about the consequences of an account takeover.

We cannot go into the specifics of this case for privacy reasons, however, according to the correspondence provided to you by Mr Waugh, eBay Customer Support is aware of this matter and is working to resolve the claim. In some instances, claims

can take some time to resolve and we aim to conclude these matters as quickly as possible. Importantly, eBay members have up to 60 days after a listing has closed to file a buyer protection claim.

Account takeovers are an industry-wide issue and not unique to eBay. In the event of an account takeover, eBay works with all affected parties to either restore an account to its rightful owner or direct members to the Buyer Protection Program.

eBay is committed to educating internet users on protecting themselves

from an account takeover. Internet users should:

1. Keep separate passwords for each online account
2. Use a password which is difficult to guess — a random combination of letters and numbers is best
3. Keep computer security software up to date
4. Never email anyone your online account details (user name and password)
5. Check online account statements regularly.

Following the above practices can greatly reduce the likelihood



IT SEEMS RIDICULOUS THAT I AM EXPECTED TO SEND BACK THE \$300 WORKING PART WITH THE \$20 NON-WORKING PART TO GET THE \$20 PART REPLACED

of an account takeover attempt being successful.

Alastair MacGibbon
Trust & Safety Director
eBay Australia

Soon afterwards, Ben's account was suspended from eBay due to "Bidding or buying with intent to disrupt a listing or sale". A few days later, eBay wrote to Ben to advise that, due to his account suspension, his buyer protection claim had been rejected.

Dear Watchdog,

I sent an email to eBay customer service as soon as the account was banned to try to get some sort of explanation and I got back a message saying that before my account can be "considered for reinstatement" I have to pay the selling fees which are not even officially due yet — they're not due till the end of this month.

I can't help feeling it's incredibly unfair for eBay to demand advance payment of selling fees before they are due (while withholding my buyer protection claim).

Ben Waugh

Ben also let us know that he would be happy to sign any privacy waiver documentation that eBay required to discuss his case with Watchdog. We let eBay know. Suddenly, eBay decided it was going to pay out Ben's claim after all.

Dear Watchdog,

Thanks for continuing to send through further information on this case. I understand from the correspondence that the member will have their claim paid out in accordance with eBay's Buyer Protection Program. As acknowledged in a prior email to you, it appears there was an error in the information sent to Ben — but it now appears to be resolved in regard to the claim.

We have investigated the other matter [Ben's account suspension] and eBay has acted according to its procedures. As mentioned in previous correspondence, eBay will always treat members' information in accordance with our privacy

policy and privacy laws. Importantly, eBay monitors key areas of the site and will proactively suspend members for wrongdoing. We also work closely with law enforcement to address any wrongdoing.

Daniel Feiler
eBay Australia

Ben said he still didn't know why eBay had suspended his account and was still happy to waive his privacy rights so eBay could discuss it with APC. eBay didn't respond to our follow-up email. Several weeks later, he contacted Watchdog to let us know he still hadn't received his refund from eBay. He also provided the following transcript of a "live chat" with a customer service representative [Ben's eBay account name has been replaced with "Ben"]:

Jonathan: Hello, I'm Jonathan and welcome to Live Chat support. How can I be of assistance to you today?

Ben: Hi, I sent an email to customer support several days ago but have gotten no response.

Jonathan: Try sending another email over.

Ben: How long will it take for someone to respond to the email?

Jonathan: Usually should only be three or four days at the latest.

Ben: Well, it has been at least five days, what would you recommend I do?

Jonathan: Send a follow-up email. The more emails you send, the better chance you have of receiving a reply.

Ben: I have, I tried once on Monday, and again on Wednesday. I've sent four emails in the last two weeks and have had no response.

Jonathan: OK. Thank you for contacting Live Chat support. Have a great day!

We contacted eBay yet again. Australian media spokesman Daniel Feiler responded and said he had started an immediate

Investigation into the "very disappointing" online chat. He said it was "completely unacceptable" and that "some internal action had been taken".

In relation to Ben's buyer protection claim, he confirmed that it was definitely approved and going ahead and that eBay had advised Ben of the date on which it would be paid. But the company still would not discuss why it had suspended Ben's account, even though Ben said he was happy to sign a document waiving his privacy rights.

DOES MCAFEE OWE YOU \$20?

Dear Watchdog,

I bought McAfee Internet Security Suite (downloadable version) for \$119.95, which was \$139.95 with a rebate of \$20, as advertised on the McAfee's Australian web site. My credit card was billed \$139.95. However, when I tried to get the rebate, the site did not list Australia as a country in which the rebate was offered. I emailed McAfee via their support site to ask why and got a totally unsatisfactory response.

Gregory Cooper
Epping, Vic

Gregory's response from McAfee:

Dear Gregory,

Unfortunately the rebate is only applicable for US and Canada residents. Therefore the rebate offers for other countries are void.

Dila
Technical Support Agent
McAfee Technical Support

We took this up with senior management at McAfee Australia and asked them to explain how Australia could be excluded from an online offer when it was advertised on McAfee's Australia-specific web site. McAfee's reply:

Dear Watchdog,

McAfee has verified that customers in Australia who purchased McAfee Internet Security online did not receive the \$20 discount offered. The web site has been corrected and McAfee has credited the discount to all affected customers, including Mr Cooper. McAfee regrets the inconvenience to Mr Cooper and the other affected customers and apologises for this unfortunate error.

Allan Bell
Marketing Director
McAfee Australia





Microsoft in bed with bankers?

Deals between Microsoft and online banks would be a bit too cosy, say APC readers.

I was greatly dismayed to read about Redmond's latest money-making enterprise... Microsoft's OneCare (APC March, page 13).

It seems that anyone foolish enough not to be using a Microsoft OS will pay the penalty — in that their online banking may be restricted! Is this a joke?

Surely this company and its far-reaching powers, which affect all of us who use computers in one form or another, can't dictate to us how we will interact online with our banks?

Isn't it bad enough that the average user is virtually forced to use flawed and vulnerable systems — in order to use the programs they need for business or pleasure — without Microsoft now deciding that we need to use their software exclusively (or banking privileges will be withdrawn)? Why do we have all these online security issues in the first place? Would it have anything to do with the OS we all use?

My partner and I run a small computer business — in the hinterland of the Sunshine Coast in Queensland — and our business survives quite well on a diet of reloading, repairing, removing spyware and virus infections and generally troubleshooting Windows problems. For this I send my heartfelt thanks to Microsoft. It's not everyday a small-time country business gets to owe a debt of gratitude to a large American company for supplying the world with an inferior product.

However, this seems to me to be the last straw in a campaign of domination which has no peer. If I choose to use an alternative OS, which I do frequently (a purchased copy of Linux Xandros 3 which dual-boots my system alongside

XP), then that should be my right. Not because Xandros is a better or worse OS, but because I don't wish to be dictated to.

If this lunacy continues to its seemingly inevitable conclusion then I will be walking into the bank and doing my business the old-fashioned way, despite the added cost and inconvenience. I will also be purchasing the commercial version of Xandros CrossOver and running

my Windows-based programs in a Linux shell — and Microsoft can go their merry way without me.

Tony Parsons
Gympie, Qld



ANYONE FOOLISH ENOUGH NOT TO BE USING A MICROSOFT OS WILL PAY THE PENALTY. IS THIS A JOKE?

letter of the month

RAID: IT'S WORTH IT FOR THE PEACE OF MIND... OR IS IT?

Like many other readers out there, I get frustrated that sites like Tom's Hardware haven't done reliability tests on SATA RAID vs SCSI RAID.

RAID is like insurance, it's only as good as the time when you need it. I know that SATA II is supposed to be more reliable than SATA, but why don't HP etc. release servers with SATA II, rather than still sticking to SATA? I have read many articles indicating that if a hard

disk fails due to a power spike etc., then SATA RAID will fall over (whereas SCSI will work). Isn't this the main cause of a hard drive falling?

I'm not really impressed that SATA RAID is just as fast as SCSI, because disk speed access for a business opening 100KB-1MB documents is not an issue; yet, there are a number of articles on sites like Tom's Hardware discussing speed — but no one tackles reliability.

I'm after a reliable system and there is no data/statistics out there guiding people to make the right decisions, only theories on how things should work. In the meantime, companies are implementing these SATA servers in critical business environments with little proof of concept.

Lyall Dilkes
Total Network Engineering
Bunbury, WA

Good point, Lyall — most of us know people who have had bad experiences with RAID when it came to the crunch of recovering data. Your Logitech MX3000 wireless keyboard and mouse set (worth \$179.95) is on its way!



your say

epinions@apcmag.com

Add to these discussion threads or email your views (in fewer than 250 words) to epinions@apcmag.com. All correspondence becomes the property of APC and is subject to editing.

Letters sent to epinions@apcmag.com must include the writer's full name, suburb, state and phone number to be considered for print publication and to be in the running for Letter of the Month prizes. Phone details will not be published.



WHAT A PIECE OF CHIP! (PT. 2)

I was quite disconcerted to read of Mr Fowler's troubles getting his faulty hard drive replaced under warranty (APC January, page 34). One wonders how many people simply cop the loss and give up — and how much this contributes to the profit margins of manufacturers.

Over the years I have built many computer systems and deep scratches to the sides of hard drives is an occupational hazard. It doesn't take much for a tiny burr of steel in the case's drive bay to put a deep scratch in the soft alloy used for hard drives.

Seagate admitted there was no damage apparent to the drive that could explain the missing chip, so it must have been a manufacturing fault.

The retailer, Umart, seems to have acted properly, if indeed they forwarded the drive for repair on more than one occasion.

Once the drive was brought to the attention of Seagate, it honoured the warranty. I guess it is hard for Seagate to honour the warranty on a drive that it never knew suffered a problem.



Wayne Singleton believes the art and rendering capabilities of LightWave 3D (as demonstrated above) should have been recognised in APC's Top 300.

If I were Seagate, I would be urgently seeking assurances from the distributor concerned that it had put measures in place to ensure this never happened again. Otherwise I would be seeking a new distributor.

Gregory Bradley
Shailer Park, Qld

HOW COULD YOU FORGET THE AMIGA?

APC's "Top 300 PC products of all time" missed the Amiga. Shame on you! We'd all still have green (or orange) on black screens today if not for the Amiga. Or worse, black-and-white Macs. Oh, and what about LightWave 3D. Sure, Maya was great for LOTR and Star Wars, but LightWave 3D showed the way many years before.

Thank you Amiga and LightWave 3D for the graphics, games and TV/movie special effects capabilities we have today.

Wayne Singleton
Strathmore, Vic

We definitely agree Wayne, the Amiga certainly was a milestone system especially when it came to multimedia. It's no wonder that Amiga fans have kept the operating system alive for so long. Head over to

www.amiga.org for more information and updates on the latest enthusiast projects. We'd love to hear more from fans of classic systems like the Amiga, especially if their machine is still working.

DON'T SHOOT THE ENABLER

I couldn't help but think that Matthew Jeffery (APC February, page 34) didn't properly read the article about the support for playing high-definition (HD) movies under Windows Vista, as he is making the implication that Microsoft is forcing him to replace his monitor if he wants to use Vista.

This is totally erroneous. It is not MS that is doing this; it is the companies that are using DRM protection that are doing this.

Matthew has apparently missed the point that, if he wanted to watch a DRM-protected HD movie, he would not be able to get the full benefit of HD and would be restricted to standard DVD-quality instead (if he did not have the required hardware, and the OS-support for that hardware). Vista has the support, which is what the article (APC December 2005, page 30) left unsaid (but was written between the lines).

apc

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THE CHIPS ARE DOWN: buying into an IT service franchise can mean overclocking your working week.



I'D LIKE TO SEE HOW MANY OUTSIDE SYDNEY AND MELBOURNE COULD TRULY BE EARNING 80K IN A YEAR

When it comes to DRM-protected content, regardless of what it is, I certainly will not be purchasing any of it, and, as many other people have said, I am not going to buy rubbish at premium prices just because the recording companies want me to (even though my computer has the capability to play DVDs and CDs).

The only reasons that I am taking this position is that I feel that my rights as a consumer are being ignored and that the producers of DVDs and CDs are simply being greedy and don't care what the public wants!

Daniel Clarkson
Edens Landing, Qld

RISK-FREE PHONE LINE

I read Samuel Wittwer's letter (APC March, page 32) regarding his problem with Telstra apparently being unable to confirm whether or not he can obtain an ADSL capable phone line to his premises. Samuel and many other people (in the same situation) may not be aware, however, that they can apply for an NPGDSL (No Pair Gains Digital Subscriber Line).

"NPGDSL" is a code used by Telstra staff to place on your order, to ensure that your line is to be supplied with cables/equipment etc. that is compatible with ADSL. It can only be used on new phone line connections (as far as I'm aware, it cannot be used to

convert an existing, non-ADSL-compatible line) and installation cost is \$209 (at last check).

If an ADSL-capable line cannot be supplied at that premises, the subscriber will normally be contacted in about 2-3 business days and asked if they wish to withdraw the order (at no charge), or continue with the order — knowing that ADSL cannot be supplied.

Now, if the Telstra CSR you speak with tells you that they don't know what you're talking about or don't know it exists (or denies its existence), tell them to look for "Additional Products", then select "Remarks" and add "Broadband Connection" onto your order. This will assist unknowing staff to append the NPGDSL code onto your order. If the CSR still says they can't assist, escalate your enquiry and ask to speak to a supervisor.

Bob Pike
Diamond Creek, Vic

WOULD YOU LIKE FRANCH-ISE WITH THAT?

Having been an IT franchisee, I was interested to read your article (APC February, page 20). I must say how disappointed I was, considering there is more than Jim's Computing and Computer Troubleshooters out there in the market. What about Doctor PC, Australian Computer Solutions and Mr Computer International?

You should also have looked at costs to start up (and what you get for that) and how much money you need in the bank to survive while building up your client base. It's hard work servicing your IT clients' needs while marketing your business as well.

I'd like to see how many outside Sydney and Melbourne could truly be earning 80K in a year without working 60 to 80-hour weeks. It's probably more like 20K in the first year (and many may not get much past that). Or they may have turned over 80-100K, but profit is a different story. What about value for your monthly franchise fee? What requirements do the Master Franchises have? Do they bulk-purchase to reduce hardware costs across their groups? Support options? (Some run forums which are no better than subscribing to Experts Exchange or using other forums out there). There are many questions that could be asked.

Scott Davey
Computer SOS
Seacliffe, Vic

In fairness to APC journo Angus Kidman, our aim was to introduce readers to the idea of computer service franchises — rather than exhaustively examining the topic. Your questions are worthwhile though Scott, and we may look at the topic again down the track.



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The new 3D

When an unknown company called 3dfx lifted the lid on its Voodoo Graphics processor way back in 1996, few realised they were staring at one of the future cornerstones of computing. Voodoo Graphics was the first 3D acceleration card for the PC, allowing gamers to run higher resolutions than before, without sacrificing game performance.

Ten years later, and while 3dfx was swallowed up by Nvidia, its

legacy still lives on. Graphics chips are no longer just for gaming. They now pack acceleration features needed for HD video consumption, but more importantly Microsoft has designed Windows Vista to have 3D acceleration as a requirement not a luxury. Encumbents in the graphics industry, Nvidia and ATI, have become major players in the PC tech game, riding on the back of a technology that few people thought we needed ten years ago.

These cards are still primarily about games though, and they deliver performance that is often held back by other components, such as the CPU. So much so, that recently announced technology such as Nvidia's extravagant quad-graphics card SLI setup won't deliver any noticeable leaps in graphics performance over dual or even some single-card systems.

This is leading the hardware industry to search for new solutions

for the performance bottlenecks — to physics acceleration to drive the need for enthusiasts to buy more expansion cards.

Most games nowadays employ some sort of physics model, which controls everything from the way debris flies to the way a player character moves around. With hardware to accelerate calculations, it is envisaged the load will be taken off the CPU and game developers will be able to include much more advanced physics models.

Two solutions are proposed. The first is a standalone card from a company named AEGIA. The PhysX chip is designed to accelerate in-game physics calculations much as a 3D card does graphics. It only works with games that use AEGIA's own physics middleware, but the company has already trotted out an impressive list of upcoming games that will support the hardware.

Nvidia, on the other hand, has flipped things around and is

proposing the use of its graphics hardware to accelerate physics. Such a system requires dual Nvidia graphics cards in SLI; one used for graphics, the other to accelerate physics. It works with Havok FX physics middleware, already widely used by game developers.

AEGIA has the tougher road ahead. Nvidia is a household name, and the install base of its cards puts them at an advantage. Plus, users can buy an SLI system and use the second card for graphics acceleration in those titles that don't support hardware physics acceleration. AEGIA, meanwhile, has to convince gamers that there is enough immediate advantage from its chip to justify the price of an expansion card that does nothing but accelerate physics in supported titles. It's going to be the big PC component battle of 2006 — and should make for some exciting breakthroughs in the PC gaming sphere. [EPC](#)



IT IS ENVISAGED THE LOAD WILL BE TAKEN OFF THE CPU FOR MUCH MORE ADVANCED PHYSICS MODELS

You want the impossible?



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you can have it!*

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Why Smart Businesses choose the MFC-9420CN

Professional Colour Laser Printer

The MFC-9420CN is much more than just a great 5-in-1 colour laser Multi-Function Centre; it also currently offers the fastest monochrome laser print speed in its category which makes it capable of handling the routine document needs of any busy office and professional quality colour laser printing needs. The flatbed MFC-9420CN provides up to 31PPM mono and 8PPM colour laser output. It also allows users to upgrade paper capacity to 530 sheets and memory to 576MB ensuring a machine that will grow with your business.



Super G3 Colour Laser Fax

As a full-function stand-alone colour fax machine, the MFC-9420CN supports up to 216 total speed dial locations, and also incorporates dual access and broadcast faxing features. You don't even need a computer to operate the fax! It also stores up to 400 pages* for out-of-paper fax reception.



Flatbed Colour Copier

At the touch of a button, create professional colour or black & white photocopies. The MFC-9420CN also supports reduction and enlargement of documents from 25-400% in 1% increments, makes up to 99 copies and includes sorting functionality. Copies up to A4 size can be made from the automatic document feeder (ADF). The flatbed design with adjustable hinge also allows you to copy from bound documents, making life very easy for around the office.



Flatbed Laser Digital Colour Scanner

When operating as a colour scanner, the MFC-9420CN has the ability to scan up to 9600x9600 dpi interpolated resolution (up to 1200x2400 dpi optical). For Windows®-based users, there is an easy-to use "scan to" button for scanning directly to an image, file, OCR, or E-mail application. The colour scanner function comes bundled with the latest document management and OCR software, helping busy offices streamline their activities.



PC Fax

Allows the user to send faxes from any desktop application in either Windows® or Mac® network environment, as easily as sending a print job. In addition, the user can broadcast the same document to multiple fax numbers using Brother PC Fax address book.



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The built-in Ethernet interface allows the MFC-9420CN to connect with a 10/100Mbit Ethernet Network. The Web-based Management and bundled BR-Admin Professional administration utilities provide easy configuration and management while connected to the network, helping your business work smarter.



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For more information on the MFC-9420CN, please visit www.brother.com.au



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Technical Specifications

General

Engine	Colour Laser
LCD Display	2 line x 16 characters
Illuminated Function Keys	Fax, Copy and Scan function keys are illuminated for ease of use
Back-up for clock	Keeps time and date backed up for 60 hours
Memory Capacity	64MB standard / 576MB maximum
Paper handling size	A4, LTR, EXE, A5, A6, B5, B6
Media Type	Plain, Recycled, Envelopes, Transparency, Bond, Labels
Paper Capacity	Input: Up to 250 sheets^ (Up to 780 sheets maximum) Output: Up to 100 sheets^
Automatic Document Feeder (ADF)	Up to 35 sheets^
Simultaneous Operation	(Print/Scan) (Print/Copy)

Printer

Speed	Up to 31ppm - monochrome / Up to 8ppm - colour
Resolution	Up to 2400dpi class (600 x 600dpi)
First Time Print Out	Less than 15 secs (mono) / Less than 21 secs (colour)
Emulation	PCL®6 & BR-Script 3 (PostScript® 3 Language Emulation)
Printer Driver	Windows® 98/98SE/Me/2000/WinNT®4.0WS/XP Mac®OS 9.1-9.2/ Mac® OS X 10.2.4 or greater
Secure Print	Yes

Fax

Modem Super	G3 33,600bps - Approx 3 seconds transmission
Data Compression	Mono: MH / MR / MMR / Jpeg
Automatic redial	Automatic redial if the recipient fax is busy
One Touch	16 (8 x 2) locations for pre-stored numbers
Speed dials	200 locations for pre-stored numbers
Group dials	Up to 8 groups
Fax / Tel switch	Automatic recognition of fax and telephone reception
Distinctive ring detection	Yes (Telstra Faxstream Duet® compatible)
Super fine	High quality transmission and reception
Grey scale	64 levels for Mono
Memory Transmission	Up to 400 pages (ITU-T Test Chart No 1)
Out of paper reception	Up to 400 pages (ITU-T Test Chart No 1)
Broadcasting locations	Send the same fax message to up to 266 locations
Batch transmission	Stores documents for the same location in the machines memory for transmission in a single call (B&W only)
Auto reduction	Automatically reduces a received fax to fit on to a single sheet of A4
Error correction mode	Where machines share the ECM feature, errors during transmission are corrected automatically ensuring received documents are error free
Fax forwarding	Sends a fax received in memory to another pre-programmed fax number
Remote access	Remotely access the machine by using another touch tone phone
Fax retrieval	Retrieve fax messages using another touch tone machine
Dual Access	Scan a fax for transmission whilst receiving a fax

Copier

Speed	Up to 31ppm - monochrome / Up to 8ppm - colour
Resolution	Up to 600 x 600dpi
Multi copy	Produces up to 99 copies of each original
Enlargement / reduction ratio	25% - 400% in 1% increments
N in 1	Compress 2 or 4 pages on to a single sheet
Poster Printing	Enlarge an image to print onto 3 x 3 pages for A4 size

Colour Scanner

Resolution	Optical	From Glass: Up to 1,200 x 2,400 dpi (colour & mono) From ADF: Up to 1,200 x 600 dpi (colour & mono)
	Interpolated	Max 9,600 x 9,600dpi
Grey Scale		256 shades of grey
Colour Depth	Input/Output	48bit internal/24bit external processing colour scanner
'Scan' key		Allows the user to scan to email, OCR, Image, File

PC FAX

PC Fax Send / Receive	Send Only (MAC)	Send and Receive Faxes from your PC, broadcast to up to 50 locations
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Interfaces

USB	USB 2.0 High Speed connectivity as standard
Parallel	IEEE1284 Parallel port
Ethernet Network	10/100BaseTX Ethernet Print/Fax/Scan Server
External TAD Interface	Interface for connecting external telephone answering devices

Network Features

Network Functions	Printing, Scanning, PC-Fax (Network Scanning Software license for 5 users as standard)
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Weight / Dimensions & Power

Dimensions	482(w) x 437(d) x 534(h) mm
Weight	34.5kg
Power (Minimum / Standby / Peak)	16W / 155W / 615W

Consumables

Toner Black	TN-04BK Up to 10,000 pages @ 5% coverage
Toner Colour (C,M,Y)	TN-04C / TN-04M / TN-04Y, Up to 6,600 pages @ 5% coverage
OPC Belt	OP-4CL Up to 60,000 images by continuous printing @ 5% coverage
Waste Toner Pack	WT-4CL Up to 12,000 images @ 5% coverage
Fusing Unit	FP-4CL Up to 60,000 pages @ 5% coverage



Brother strongly recommends that our customers use Genuine Brother consumable products only. By using genuine Brother consumables the benefits to you are:

- Better quality prints
 - Greater yields per consumable
 - Protect your machine from damages
 - Achieve optimum performance.
- Your machine warranty may not cover any damage arising from the use of non genuine Brother consumables. Your machine should be used only in a clean, dust-free environment

Options

Lower Tray	LT-27CL (up to 530 sheets^)
Memory	Expandable to 576Mb

^ On 80gsm paper.
* ITU-T Test Chart No. 1

About Brother Australia

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All specifications subject to change without notice.

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Toshiba TDP-FF1

A portable unit with battery power and vibrant colours; ideal for presentations.

Lugging projectors between meetings has long been the bane of professional salespeople and marketers. While small projectors have come along in leaps and bounds in recent years, Toshiba has come up with a little gem for the road warrior.

Toshiba's diminutive TDP-FF1 projector is pitched squarely at the mobile presenter and ships with a fold-out screen and 4400mAh battery pack to allow the user to set up demonstrations away from mains power. The screen is designed to work at a range of 80cm, so it's perfect for small boardroom meetings or impromptu presentations.

Instead of a conventional bulb, the diminutive Toshiba device employs an LED to drive the backlight, which allows the entire unit to be extremely compact. In fact, it measures a scant 10 x 13.5 x 5.5cm, and weighs in at an incredibly light 850g (with battery). One of the advantages of the LED technology — apart from the small size and reduced power demands — is the life. Toshiba quotes a lamp life of 10,000 hours, which far surpasses the 2,000–4,000 hours common to regular bulbs.

The company boasts a 1,500:1 contrast ratio for the device, but we measured it at a lowly 31:1 at a range of 1m. The low contrast ratio means that it's difficult to watch movies on it, as the image appears either too dark or washed out: there's not enough variation between the shades to discern detail in poorly lit scenes. It's fine for presentations that generally comprise text or coloured graphs on a plain background though. A measured brightness reading of 1,453 lumens means the Toshiba unit has enough kick to overcome boardroom fluoros.

The device relies on a DLP colour wheel to produce an image and offers surprisingly vibrant colours for such a small device. The unit runs natively at SVGA resolution (800 x 600 pixels) and



CONTACT	Toshiba
PHONE	13 30 70
ONLINE	www.isd.toshiba.com.au
MARKET	Business
PRICE	\$1,799

✓ Tiny, light, portable.

VERDICT ★★★★★

✗ Poor contrast; USB support limited.

offers a 4:3 aspect ratio. The silver and white unit is clearly designed to be pulled in and out of bags for presentations (as it includes a recessed lens, with a focus ring tucked out of harm's way).

POWER PACK

Though the TDP-FF1 is one of the smallest projectors ever seen in the APC Labs, it packs just about all the features of a larger device. The top face of the machine offers an array of status lights and control panel buttons, while the left side includes the connectors: VGA and composite video inputs, a Walkman-style audio jack, a headphone socket and a USB port. There's also a Kensington lock point for anyone looking to mount the device permanently in an office or meeting room. The bottom of the device includes feet for adjusting the projection angle.

A power supply and VGA cable are bundled in, along with a comprehensive printed manual and a PDF version on CD-ROM. A small white remote control is also provided and can be used to drive key functions during use.

The TDP-FF1 sports a stellar on-screen menu that allows fine control over horizontal and vertical position, tint, sharpness, brightness, contrast, as well as image phase and frequency. Vertical keystone is offered as well, but there's no horizontal correction, so the device has to be parallel to the display surface. This isn't too lamentable given the projector is clearly aimed at the presentation market and not homes, where users may want to integrate the device into a theatre environment.

One elegant feature is the TDP-FF1's ability to work with memory sticks. The side panel includes a USB port that allows the user to drive presentations directly from a USB memory key. It's possible to start a slideshow automatically if there are JPEG images in the root directory of the key, but Toshiba has also bundled a useful file browser that offers thumbnail views of images and folders on the drive. Navigation is straightforward, and it's possible to arrange slideshows of images. Unfortunately, JPEG is the only image format supported, and those wishing to display

PowerPoint presentations will still have to rely on a notebook to drive the projector. The device doesn't work with USB hard disks or hubs either, so you have to make sure you copy any images to a USB flash drive.

Toshiba quotes a battery life of 500-charges, and the cell contains enough stored charge to drive the machine for up to two hours at a time.

All up, the Toshiba TDP-FF1 is a great little unit for presentations — and in that regard it serves its target market well. The inclusion of a battery that provides two hour's life and a mobile screen will allow anyone in sales or marketing to transport the unit to and from meetings without having to worry about a suitable surface for the display. Don't expect stellar results if you want to take the unit home on weekends to watch movies though. The ability to run JPEG slideshows directly from USB memory keys is a handy inclusion, but PowerPoint support would really impress.

Michael Robinson



Samsung TS-H712A Blu-ray for the PC

**WORLD
FIRST!**

It's hard to tell a Blu-ray drive from any other optical drive, until it burns 25GB of data onto a single disc for you.

With 25GB of capacity on a single-layer disc, Blu-ray makes DVD look decidedly retro. John Gillooly got the first Blu-ray drive in the country into the Labs to see if it lives up to the hype.

It seems 2006 is the year the next-generation DVD format wars will come to a head. Until now, the competing Blu-ray and HD-DVD camps have talked a lot — but hardware has been thin on the ground. This is now set to change as the first HD-DVD and Blu-ray devices begin to appear — starting with Samsung's new TS-H712A Blu-ray drive.

The Samsung drive is the future of optical storage devices, and its first destination when arriving in Australia was the APC Labs. This was no mean feat, the drive we managed to score had winged its way from Cebit in Germany, then to Korea before docking with APC in Australia. We had it on the testbench before even Samsung

had a chance to play with it.

While Toshiba had to delay the launch of its HD-DVD drive to wait for movie studios to release media, Samsung has powered ahead with the launch of this internal 5.25in Blu-ray recorder. It may resemble a DVD burner, but the unit is a lot more than that, packing DVD+R/RW burning alongside the ability to read and write Blu-ray discs.

Before we get into the details of the drive itself, it's important to understand the inherent differences between the Blu-ray and HD-DVD approaches to the next-gen storage problem. Both formats have been designed — first and foremost — to allow high-definition video content to be distributed. Blu-ray has been

spearheaded by Sony, with big-name companies like Samsung, Panasonic, Dell, Apple and HP onboard with a commitment to supply hardware.

HD-DVD has been driven by the DVD Forum and includes high-profile supporters like Toshiba, NEC, Microsoft and Intel.

There are some similarities between the two technologies. Both aim to increase data density on discs by using a blue-violet laser, rather than the red laser used in DVD. Blue lasers have a shorter wavelength than red, which enables more information to be written to a disc.

HD-DVD achieves this by modifying existing DVD technology. This allows for cheaper

transitioning of media and drive production to the new format than Blu-ray (but means it delivers slightly lower media capacities). HD-DVD discs will come as single-layer 15GB and 30GB dual-layer discs. On the flip side, Blu-ray discs will come as 25GB single and 50GB dual-layer.

Blu-ray, in contrast to HD-DVD, involves a swathe of new technology for drive and disc construction — and will initially come with a price tag to match this effort. We say "initially", because the Blu-ray camp has one product up its sleeve which will potentially drive it to an unassailable lead (and cause prices to fall as production ramps up). This, of course, will be when Sony unleashes its not-so-

secret weapon, the PlayStation 3.

Sony's next-generation console is set to launch worldwide in November 2006 and comes with a Blu-ray drive as standard. Sony is betting that this will drive uptake of Blu-ray movies — much like the PlayStation 2 drove sales of DVD. If PlayStation 3 has anywhere near the success of its predecessor, it's safe to say that HD-DVD will go rapidly the way of LS120 SuperDrives and Betamax VCRs.

With Blu-ray being intrinsically linked with Sony, it may come as a surprise that the first drive to enter the country hails from Samsung. However, dig a bit deeper and you find that Samsung has just as much to gain from Blu-ray's success.

Remember, Blu-ray offers significant capacity gains for PC-based storage, but its primary purpose is as a distribution method for HD video content. Samsung is one of the largest players in the display panel market — and hence, one of the biggest proponents of the move to HD televisions.

Samsung has taken a very proactive approach to driving uptake, such as teaming up with Microsoft to push the HD message behind the Xbox 360. Blu-ray is another part of this equation and is ultimately seen as something that will drive a desire for better displays in the near future.

By launching an internal drive so early, Samsung not only allows PC users to store unheard-of amounts of data on a disc, but enables living-room PCs (with appropriate video-decoding hardware) to play back Blu-ray movies. With the Intel Viiv push gaining momentum, we expect to see these drives showing up in media-focused systems sooner rather than later.

OUR LABS TEST

As drives go, Samsung's TS-H712A doesn't exactly look spectacular on the outside. Apart from the Blu-ray logo on the tray, it looks just like a normal CD/DVD writer. It attaches via parallel ATA, much to the disappointment of the APC Labs team (who hoped that a next-generation device might finally make a move to Serial ATA).

Installation is simple. The drive is detected by the BIOS as UDMA mode 2 straight off the bat. Once



Windows had booted, we needed to install a recent version of Nero InCD to enable support for the UDF 2.5 file format (as used on Blu-ray discs — the newest versions of Nero also support burning Blu-ray media and playback of HD video content).

Being so early in the game, Blu-ray discs were hard to come across. However, Samsung supplied some video samples to us on a rewritable BD-RE disc, so after a quick data backup, we were ready to see just how long it took to fill the 23,866MB of space available to us on the formatted disc.

Like CD and DVD, Blu-ray uses the 1x, 2x nomenclature to denote drive speed. The Samsung TS-H712A is capable of writing at 2x,

which in Blu-ray terms is a transfer speed of 8,990KB/s. This gave rise to a familiar annoyance once associated with first-gen optical drives — it took 45 minutes and 35 seconds to burn a full BD-RE disc.

Once our burning tests were complete, we wiped the disc and put the video samples back on. These samples consisted of two Samsung clips showing Blu-ray quality video and two Microsoft Windows Media 9 HD demo clips. If you've never seen a HD demo clip before, they invariably consist of very high resolution, rich colour imagery and incredibly slow movement to minimise blurring of the image.

Even with the limitations of demo videos, the APC Labs team is

consistently impressed with the leap that HD video offers, and the Blu-ray clips were some of the best we've seen. It's hard to truly convey the leap in image quality without seeing it for yourself.

CONCLUSIONS

It's rare that we get early hardware samples in the APC Labs that just work. Despite the fact that the Samsung TS-H712A had crossed several countries before arriving in Australia, installing the drive was a painless experience. Apart from the need to install InCD for UDF 2.5 support, the drive looks and detects like any other optical drive out there.

While the TS-H712A won't be cheap when it launches, it also won't be as expensive as the first-generation CD and DVD burners. Samsung are looking at a price tag of around \$800, although this will fall once demand increases and production grows. It also has a second model in the works, the TS-H712B, which burns Blu-ray and also most writeable DVD and CDs.

For PC enthusiasts, Blu-ray brings an unprecedented level of removeable storage to play. As long as you prioritise capacity over burn speed then the TS-H712A is not only an excellent proof of the Blu-ray concept — it is also an excellent drive in its own right. **APC**



FOR PC ENTHUSIASTS, BLU-RAY BRINGS AN UNPRECEDENTED LEVEL OF REMOVEABLE STORAGE TO PLAY





Apple MacBook Pro

One Apple, two cores — but will it satisfy your appetite?
Dan Chiappini examines the latest addition to the Mac family.

The IT industry, like any other, is a real microcosm when you look below the surface. It's also an industry driven by — and one of the best examples of — duality. Users are allied and segmented in whichever area you look, whether it's components, peripherals or add-ons. Given the ultra-competitiveness of the space, it's not often that any segment is fought across more than two fronts. In the graphics card space, Nvidia and ATI fanboys fight it out for bragging rights on whatever topic is hot that month, be it image quality, shader model compatibility or cooling acoustics.

Probably the best example though is the ongoing war that rages between Microsoft, Linux and Apple on the operating system front. Users throw themselves into the fray, both across the internet and offline, each convinced their platform is superior — and looking to sway others using any means possible.

Apple users have always been staunch in sticking to their guns in defence of the PowerPC (PPC) micro-architecture, insisting that the platform is as powerful as any non-Apple notebook available. Time and time again this has been disproved and, having done more

than our fair share of Labs performance challenges, we can unequivocally say that while Mac OS has a lot going for it, the hardware has traditionally always been a bit of a let-down.

So, imagine Mac users' eyes lighting up when the announcement was made last year that Apple would switch to Intel's x86 micro-architecture platform for its next notebook generation.

The news spread like wildfire; would this be the best of both worlds? Intel's globally recognised hardware configurations *with* the stability and intuitive interface design of OS X. Dual-boot Windows

GOING INTEL HUNTING

1



2



3



4



5



THE NEWS SPREAD LIKE WILDFIRE; WOULD THIS BE THE BEST OF BOTH WORLDS? INTEL WITH MAC OS X

and Mac OS on one machine? Has the world gone topsy turvy?!

We managed to get our hands on one of the first MacBook Pros (MBPs) in the country, and we know you wanted more than just a brief gloss, so, against all good judgment and threat of legal pursuit — we ripped the thing apart. C'mon, we're geeks; we want to see what makes it tick and we know you do too. Check out the DVD for a bunch of other photos of the Mac in varying states of undress.

From a technical point of view, the new generation of Apples are not only the company's first Intel-based machines, but also represent

its first foray into dual-core for their mass-market products — both mobile (MacBook Pro) and deskbound (the new iMac and Mac mini Duo).

The MBP comes in three different speeds — 1.83GHz, 2GHz and 2.16GHz — all based around Intel's recently launched Core Duo CPU. Once you've made your choice, the amount of RAM (up to 2GB of DDR2), your preferred size of hard drive (either 80, 100 or 120GB) and whether you'd like the 128 or 256MB version of the ATI's X1600 graphics card — for playing all those lovely Mac games on — is about all you need to decide on.

Apple has finally brought its products into line with the other products available in the marketplace and, while still not cheap, even the 2GHz model with a gigabyte of RAM, high-end graphics and all the bells and whistles represents significantly better value than the identically priced 17in G4 model at \$3,999.

A quick scan down the spec list yields some interesting results. FireWire 800 has been given the boot in favour of USB, and there's no integrated modem — although there's a USB add-on dongle for \$79.

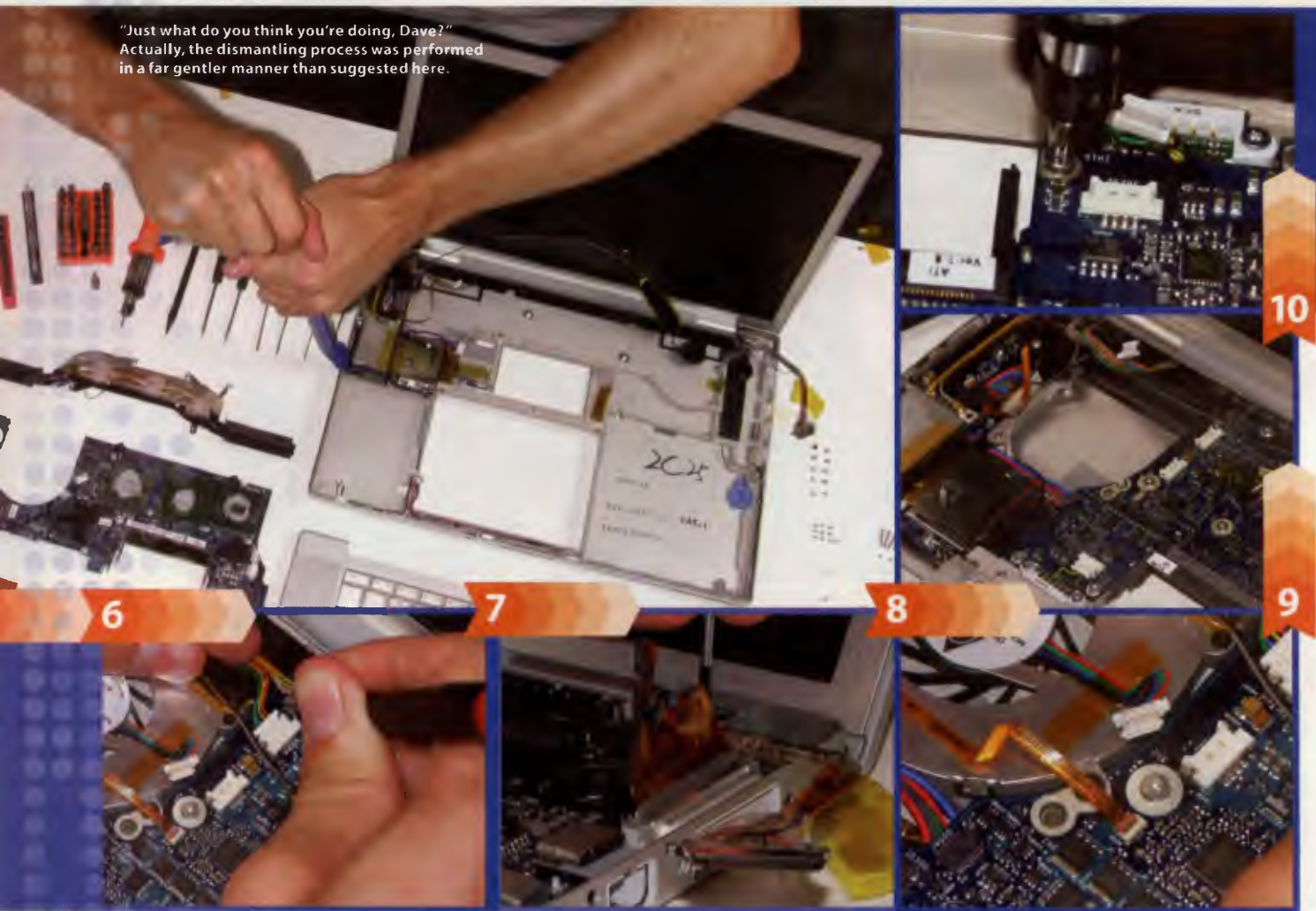
Apple has very consciously made this their most attractive

- 1 The first step is to remove the battery housing and RAM.
- 2 To access the internals it is necessary to remove 17 screws.
- 3 Disconnect the trackpad and keyboard ribbon cable.
- 4 Remove the Bluetooth board and the hard drive ribbon cable.
- 5 Disconnect the SuperDrive ribbon cable and remove drive.

notebook yet, with its stylish lines and minimalist connectivity, but without leaving out the essentials. Our unit came packing an AirPort Extreme 802.11g and Bluetooth 2.0 module with EDR support, which is designed for better battery life and improved multiple-device communications. The Wi-Fi antenna has been hidden beneath a rubber seal which dramatically improves the signal strength (compared to the



"Just what do you think you're doing, Dave?"
Actually, the dismantling process was performed
in a far gentler manner than suggested here.



THE X1600 GRAPHICS HAVE CERTAINLY GOT THE GRUNT TO DRIVE THE 1,440 X 900 PANEL

metal cover which was used on the last model).

Weighing in at just over two-and-a-half kilos, it's not an ultraportable by any standard, but it's not uncomfortable to lug around. Be warned: it's just slightly larger than the previous G4 model — to incorporate the 0.4in wider display — so if you're upgrading and plan to hold on to one of your G4 bags, your new toy might be just slightly too big.

Previously it was all too easy to dismiss Apple's mobile products as being over-hyped and underspecced (and the domain of designers and trendy students with

more dollars than sense). But we're the first to admit, there are plenty of points of differentiation here. For one thing, whether you're upgrading or if this is your first step into the Mac world, the display is bright and crisp, making everything from spreadsheeting to watching a movie a real pleasure. It's incredibly similar to the display on the 20in iMac we were playing around with last month (APC April, page 53). So much so, that we have a sneaking suspicion it may be a scaled-down version of exactly the same panel. The X1600 graphics certainly have the grunt to drive the 1,440 x 900 panel. The biggest problem for

those looking to switch from Windows (and with a bit of a penchant for gaming) will be finding something decent to play. Luckily, World of Warcraft runs on both Windows and OS X.

The MBP comes with an integrated iSight webcam which, combined with Photo Booth, provides hours of face-pulling and snapping fun. OK — maybe not hours, but we had fun for at least 45 minutes. You can also use iSight for video conferencing, saving you having to lug around a USB camera for off-site impromptu meetings.

Another nifty little extra is Front Row, which is essentially the Mac

version of Media Center (without the live TV support), letting you remotely view your DVDs and photos (and listen to music through iTunes). While you won't get the big screen impact you would from a 50in plasma, just throw your MacBook Pro on the coffee table, chuck in a DVD and you're away.

There were a couple of other features that really floated our boat. Clever little things that you're sure someone *must* have thought up before now. But there they are on the Mac and we salute Apple (and hope the other manufacturers follow suit rather than feel embarrassed that they didn't think of it first). The first is the MagSafe power connector, designed to easily release the power supply from your notebook in the instance that you get up quickly and forget you're plugged in, or if someone trips over the cord. It's simple, it's

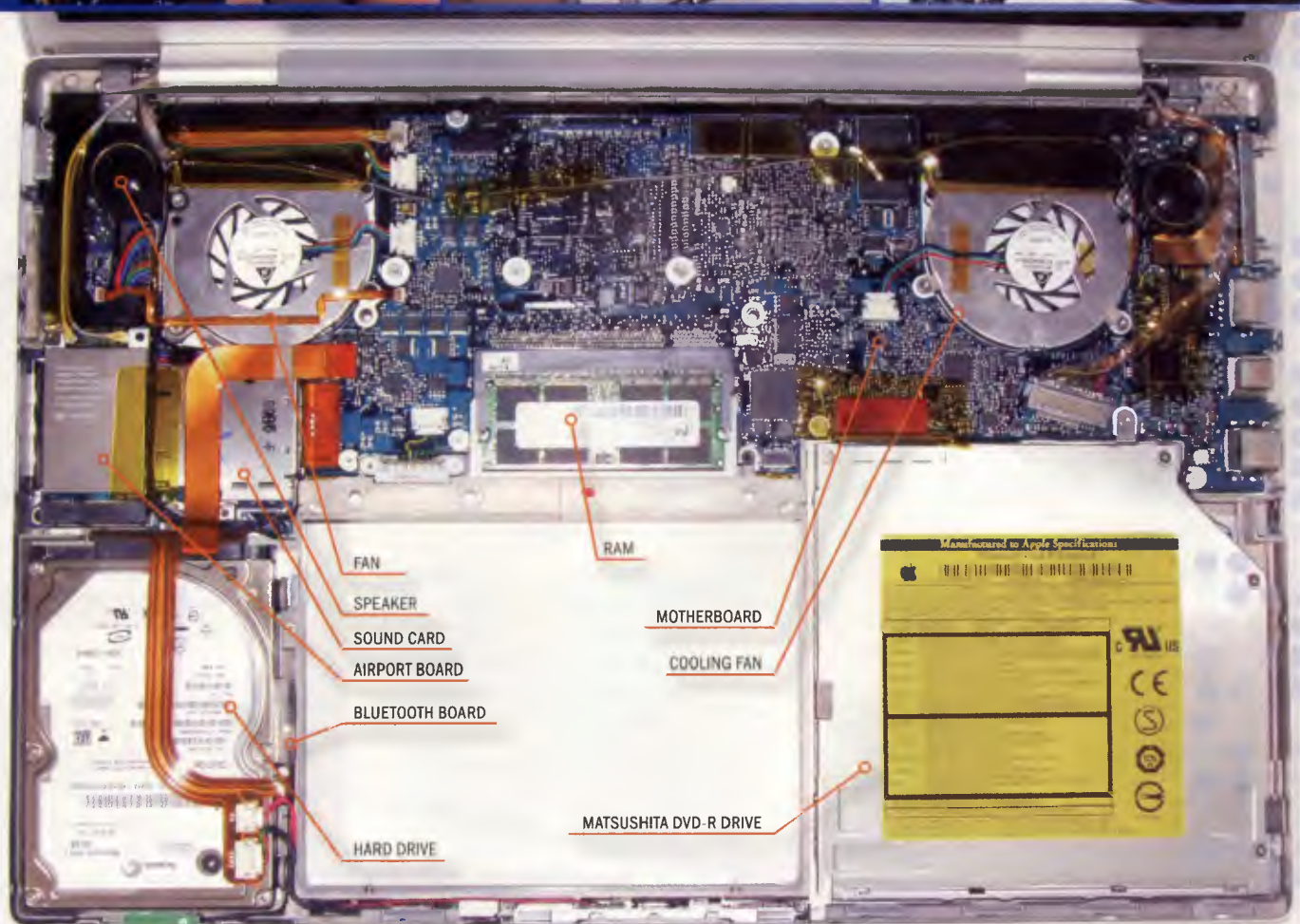
11



12



13



effective and, most importantly, it works. We also liked the ambient light-controlled backlit keyboard; while not a new feature, it comes in handy when you wake up during the night and need to bash out an idea, or if you're seated on a flight in semi-darkness. It's perhaps less useful for touch-typers. The display has a similar feature, adjusting your monitor's brightness dependent on the surrounding environment's light levels. Again, it's not the killer app — but still a nice innovation.

Our favourite though has got to be the battery tester on the bottom of the chassis. Press and hold the button and a row of LEDs will light up, showing how much battery life is remaining (without having to power it up to check). Genius!

We averaged around three to three-and-a-half hours of battery life per charge, which isn't stellar, but about par for what we've come to expect from notebooks. It's no Centrino ultra-portable-eight-hour-road-warrior machine, but

- 6** Disconnect the inverter and iSight cables which attach the Airport board.
- 7** Remove the orange foil on the right side of the logic board.
- 8** Disconnect the fan connector and the orange ambient light sensor cable.
- 9** Remove fan screws and lift out fan.
- 10** Remove all 10 screws holding the motherboard in place.
- 11** Remove the PC card and battery connectors as well as temp sensor.
- 12** The motherboard can now be turned over to view the Intel chip.
- 13** The cooling system is the last piece to come away.



But it came like this: actually, after 45 minutes of unscrewing and disconnecting parts, this is what you're left with.



LEFT REMAINING IN THE LOWER CASE IS:

- The PC card cage
- DC connection
- Airport card
- 2x speakers
- Sound card
- Subwoofer

you shouldn't be in any trouble as long as you remember to carry your power supply with you. We hope the next iteration of the MBP will grow this beyond five hours of usable battery run-time. Given Intel's involvement in alternative energy battery development, it may be fuel-cells for the next model.

Talking performance, while we couldn't run the MacBook Pro through a rigorous set of tests as we would for other notebooks (due to the lack of cross-platform benchmarking utilities available), we have measured it by typical usage — and we're impressed. Consistent with Apple's claims, the MBP handles universal code very well, with good gains over the equivalent on a G4. Mac OS X is fast and responsive and, while not hugely demanding, makes for a very smooth user-interface segue to your applications. iTunes, iLife '06, Safari, Mail and a list of others are already using the "universal binary", with a swag of applications in the porting process to give users

the best experience regardless of their platform.

It's only when you start to use non-native applications under Rosetta — which need to be translated in real-time — that you start to feel a performance hit. Programs such as Adobe Photoshop CS2 are currently not natively supported, so the extra translation slows things down, especially in system-intensive moves such as using rotate and blur effects. No doubt, as applications get churned into universal binary, performance will increase dramatically, but, as yet Adobe has not confirmed CS2 will

NO WINDOWS ON MAC

Microsoft dropped a bombshell at the recent Intel Developer Forum in San Francisco. It has decided not to allow Windows Vista to boot on PCs that use the new Extensible Firmware Interface (EFI) instead of BIOS. This will be delivered in a "future release" of Windows. Intel Macs use EFI exclusively, dashing hopes of dual-booting Mac OS X and Windows. Full IDF report, page 16. Of course, in the absence of an official solution, an enthusiast has hacked together an EFI bootloader for XP, making "unofficial" dual-booting possible. You can download the files from <http://wiki.onmac.net>.

be ported (and rumours abound that we may see CS3 before a universal binary version is released for Intel Macs).

The excitement around the MacBook Pro is justified given the huge paradigm shift occurring in the Apple camp, but we're wary about being the first people to plunk down four grand for a piece of hardware that is going to take a while to have all the kinks ironed

out. We don't doubt Apple will get there, and the performance — and indeed, choice — of an alternative to Windows (without learning Linux) may be enough to genuinely make

users want to switch, but how long it will take to get to that point remains a mystery. If you're a home user with basic needs, predominantly running universal apps (and have some cash burning a hole in your pocket), go for it. But semi-pro and mission-critical users might want to hold off a little longer to avoid the teething process that's inevitable when a change as large as this occurs.

At the end of the day, we reckon the Intel-based Macs will do wonders for the notebook market in terms of competition, innovation and performance. If you're not ready to take the plunge just yet, hold off and get back to trawling the forums. www.apcmag.com

CONTACT	Apple
PHONE	13 36 22
ONLINE	www.apple.com/au
MARKET	Everyone
PRICE	From \$3,199

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VERDICT ★★★★★

✗ Expensive.

Capture

7

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response time



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- Choice of black, ivory or silver finish color

Gigabyte AirCruiser MIMO Router

The GN-BR03GM offers good range plus a straightforward, secure setup interface.

Wireless hardware has revolutionised small business and home networking, but implementations early on weren't a panacea. Though the flexibility was welcome, poor signal range made it relatively difficult to provide an entire house or office with cover.

MIMO (Multiple input, multiple output) hardware is designed to circumvent the issue by employing several antennas to help boost signal strength. MIMO hardware is able to split data when broadcast, and then reassemble it at the receiver to substantially boost speed and range. A conventional Wi-Fi access point or router doesn't account for this and signals drop away as soon as you get more than around 20m from an access point. In testing, the Gigabyte router was able to maintain a consistent signal at over 40m (line of sight), which

CONTACT	Rectron
PHONE	(02) 9748 7725
ONLINE	www.rectron.com.au
MARKET	SOHO
PRICE	\$110

helps make it ideal for use in a large home or spaced out site office.

The device is designed to interface with an ADSL modem and is a good choice for people looking to share an incoming internet connection with several wired and wireless clients. It offers four LAN ports, a WAN interface, status lights for each physical LAN and WAN port and separate LEDs for wireless LAN activity and power.

The kit includes a fold-out quick-start guide that covers setting up the device to work with a notebook PCMCIA Wi-Fi card and how to configure WPA, which allows even the uninitiated

✓ Good security from the box.

VERDICT ★★★★★

✗ Unappealing appearance.

to configure a solid, reliable and secure connection. It's an excellent feature and something APC suggests more vendors should adopt.

The AirCruiser managed impressive results with a standard 802.11g Wi-Fi adaptor. At a range of 40m and through a brick wall,

the device maintained a speed of 423Kbit/s (where other non-MIMO routers achieved no connection).

It even supports Wi-Fi Multimedia (WMM), which prioritises audio and video traffic to maintain quality of service (QoS). Standard routing functions are offered and SPI filtering by MAC address (and protection against DoS) complement the 64/128-bit WEP and WPA/WPA2 security to provide a simple, configurable and secure Wi-Fi router for the home or small business workgroup.

Michael Richardson



Pinnacle PCTV 310i

Analogue, digital and even HD support render this TV tuner a compelling choice.

Although digital TV hasn't taken off in Australia (due to a lack of specialised content to take advantage of the medium), manufacturers are chipping away and producing increasingly impressive hardware capable of bridging the gap between analogue and digital (DAB) broadcasts. Pinnacle's PCTV 310i card offers both digital and analogue tuners and supports high-definition digital broadcasts in addition to FM radio.

A bundled quick-start guide takes the pain out of setting the system up, although the only tricky part is connecting the supplied audio cable from the tuner to a soundcard or motherboard.

The PCI card itself ships with Pinnacle MediaCenter software, which is a capable media manager that allows you to play stored music and video, as well as watch, schedule and record live TV and radio. The interface is intuitive, and it takes around half an hour to install the package, configure channels and schedule a few regular recordings. One handy feature is the ability to record to DivX, which substantially saves disk space and spares you the hassle of converting footage further down the track.

In addition to the software bundle, the box also contains a large silver remote control (with batteries), and an infra-red receiver. The software is lounge-room friendly and offers a "2-foot" configuration interface and a "10-foot" UI that relies on the remote control to drive menu functions. There's also a composite to S-Video adaptor and a CD-ROM audio cable, which prove handy when setting up for the first time.

The card provided excellent image quality throughout testing, with accurate colour reproduction and little sign of ghosting. There's a slight lag in swapping between channels, but it's bearable (and

easy to live with considering the impressive image quality).

After recording a show, the package relies on Pinnacle Studio 9 to edit recorded videos. It's a top-notch editor and it doesn't take long to become familiar with the interface. It offers a timeline view that makes it straightforward to cut out ads — and then save the edited footage for archiving.

Windows XP Media Center Edition compatibility, support for analogue, digital and FM broadcasts and all the bundled extras conspire to make the 310i a compelling digital tuner for an entertainment system or high-end PC.

Michael Richardson



CONTACT	Lako Pacific
PHONE	1800 657 601
ONLINE	www.lakopacific.com
MARKET	Everyone
PRICE	\$199.99

✓ Good bundle; excellent image quality.

VERDICT ★★★★★

✗ Lag in changing channels.

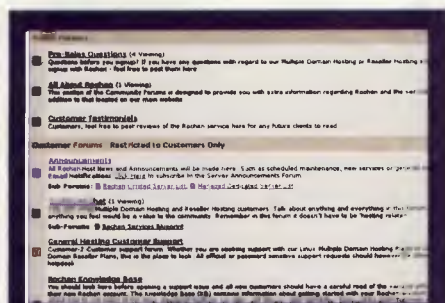


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Nvidia GeForce 7900 GTX

Has it been six months already? Nvidia announces its latest GPU.

Nvidia has enjoyed an incredibly good run since the launch of its 6x series about a year and a half ago.

The new 7900 GT and GTX products are very closely modelled on the 7800 series cards, although there have been some interesting tweaks under the hood to help set the tune for coming generations. These include the move to 90nm process and the subsequent die size reduction, as well as a lowered transistor count, 100MHz core clock-speed increase and a 100MHz decrease in memory clock speed — most likely to improve yield rates. These changes should help iron out any

fab yield issues ahead of the next generation and reduce the power and heat output of the card, resulting in a cooler and more power-efficient architecture.

In the performance stakes, we ran the 7900 GTX against both the 512MB version of the 7800 GTX and the competing ATI X1900 XTX card. Gains over the 7800 were consistent with our expectations, although they only amounted to a few percentage points. Head-to-head with the ATI part, however, it was a little more of a mixed bag. The 7900 GTX took out bragging rights in the default 1,024 x 768 tests in the more recent 3DMark06, but lost ground in both the '05 test and high resolution 1,600

x 1,200 test with High Dynamic Range (HDR) enabled. While the margins between the two were a few hundred marks in the lower resolutions, the X1900 XTX clearly had the edge at higher res, putting the best part of a thousand marks between itself and the 7900 GTX.

This generation appears to represent more of a product refresh than a whole new line, suggesting Nvidia still has a few tricks up its sleeve. If you already own a 7800 GTX, the difference between

this and the 7900 GTX will be like going from fast to faster — but since the 7800 already plays current-generation games so well, it's a bit of a moot point. On the flip side, if you're looking to upgrade, the 7900 GTX offers fantastic performance today and the option of SLI later if you want to add another card.

Dan Chiappini



CONTACT	Nvidia
PHONE	N/A
ONLINE	www.nvidia.com
MARKET	Performance enthusiasts
PRICE	\$TBA

✓	Performance part.
★ ★ ★ ★ ★	VERDICT
✗	Minor performance gain on last generation.

Brother Colour Laser MFC-9420CN

It's big, it's clever and it gets the job done.

Brother's latest product release for the important SOHO/small business market is a doozy: a 31-page-per-minute mono, eight-page-per-minute colour printer with all the trimmings. Designed as a central office tool, the MFC-9420CN combines the printer functionality with a 3G 33.6Kbit/s colour fax, scanner, copier and PC fax, as well as a swathe of security features. Multiple-page scanning and faxing is also accommodated with an automatic document feeder. The unit connects via a 10/100 Ethernet interface or USB 2.0 port.

The included management and user software is comprehensive and easy to use.

The PC-centric features of the printer work using push technology — the user just walks to the printer, puts in the page and hits the scan button. The file is

automatically packaged and sent to a predefined directory on the PC. Similarly, a secure printing function has been included: the printer stores the print job until the user enters a password at the printer — no more running from the PC when printing a sensitive document.

The MFC-9420CN had reasonable performance on the bench, though it was far from breaking any records. The print time of APC's standard 20-page mixed text/image document took three minutes, 21 seconds. Output quality was excellent — no issues or artifacts noticeable. Copying a full-colour magazine cover took 28

seconds at 300 x 300dpi, while scanning to a PC in JPEG format churned out a 1.7MB file in one minute and 26 seconds with reasonable colour reproduction. Scanning to PDF took the same.

Brother's new MFC-9420CN is a solid offering in a saturated market and has some interesting features. It did leave us with a small wishlist for further flexibility. First, there's no duplexing — a concession to the top-mounted scanner attachment. Second, the printer's original paper tray is wimpy at 250 sheets — even a small workgroup would need to top it up constantly.

Nick Race



CONTACT	Brother
PHONE	(02) 9887 4344
ONLINE	www.brother.com.au
MARKET	SOHO
PRICE	\$1,599

✓	Good functionality; secure printing.
★ ★ ★ ★ ★	VERDICT
✗	Small paper tray; no duplex functionality.

Iomega ScreenPlay Pro

An all-in-one media library — just don't expect too much portability

Iomega's ScreenPlay Pro is a 200GB external hard drive that also plugs into your television and home stereo — letting you take your multimedia library into the lounge room. It connects to your computer via FireWire or USB 2.0, letting you drag and drop music, video and image files. Thankfully there's no need to install any special DRM software, the ScreenPlay Pro works with Windows, Mac and Linux.

The device stands out with its inclusion of Iomega Automatic Backup Pro and FolderShare, both Windows 2000/XP only, the latter offering remote access to the drive and the ability to sync files between PCs. Connecting the ScreenPlay Pro to your TV presents you with intuitive and easy-to-read menus which can be accessed using the full-sized remote. Playback quality is excellent. It handles an impressive range of file formats including MPEG-1 (AVI, MPG, DAT),

MPEG-2 (AVI, VOB), MPEG-4 (DivX, XviD) and ISO video files, plus it's compatible with DivX Video on Demand (<http://vod.divx.com>). Also, it can handle MP3, WMA, WAV and OGG Vorbis audio files. Photo slideshows are restricted to JPEG, but you can view, rotate, zoom and pan images. It supports PAL and NTSC including HD video up to 1080i and digital audio — the fact that it only has composite and S-Video outputs means you can't watch HD in its full glory. The remote control and power supply make it tough to carry about, but the 60GB ScreenPlay (\$399) is designed for portability. The main drawback is that you have to lug it and the power supply to your computer

every time you want to copy files. For the same price you can get a network DVD player with an optical drive as well as Ethernet and Wi-Fi for accessing files stored on your home network. This is the ScreenPlay Pro's weakness — it's good at what it does but other devices are more convenient. Still, if you'll also use it for data backup, the Pro makes a decent all-round storage and entertainment device.

Adam Turner

CONTACT	Iomega
PHONE	(02) 8223 9140
ONLINE	www.iomega-asia.com/ap
MARKET	Everyone
PRICE	\$549

✓ Handles lots of formats; good menus.

VERDICT ★★★★★

✗ No battery; no HD output.



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Checkpoint Commander 5.7.0

Everybody's got something to hide except for me and my monkey.

Checkpoint Commander (CPC) is an open source Linux utility designed to manage, encrypt and securely delete your files. Employing a 256-bit Cipher Block Chaining (CBC) Advanced Encryption Standard (AES) algorithm, CPC can be trusted with encryption of your data. A Keyed Hash Message Authentication Code (HMAC) in conjunction with an iterative cryptographic hash function (SHA-1) is used to verify that the archive has not been modified (tampered with). AES is a wonderfully fast and, at least for now, secure algorithm. Users requiring heavy duty encryption won't need anything else. CPC is, unfortunately, a bit weak in one regard. It readily accepts any eight character (or more) password, so make sure you have a good one!

Secure deletion of files is another major feature of Checkpoint

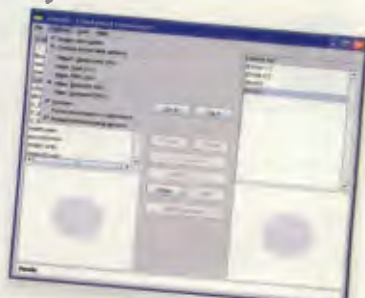
Commander. CPC has five file-removal modes: delete only, fast, FIPS, Schneier and Gutmann. Fast mode uses a single-pass algorithm which fills the space occupied by the "deleted" data with pseudorandom numbers. FIPS is a three-pass algorithm. It fills the space with zeroes, then ones and then pseudorandom numbers. Schneier algorithm employs FIPS and then runs for another six rounds filling space with more pseudorandom junk. Chances are that if you use Schneier, no agency in the world will be able to recover your files. To find more about file encryption and file deletion in Checkpoint Commander, read the Devices chapter in the user guide.

Even though a great deal of effort was put into the algorithms, the user interface and the install procedure still require a bit of work. Unnecessary message boxes and an unintuitive interface are a bit disappointing. It just needs a little bit more overall polish to impress. . . CPC can also work as a simple file management tool. It doesn't have a lot of options but it can copy, move and rename files. It can search and it understands regular expressions. There is also an included text and hex editor, a basic image viewer, a very simple audio player and a JAR/ZIP opener. All-in-all, CPC can be a useful little tool. If only a little more time was spent on it.

Peter Sbarski

CONTACT	Caversham Computer Services
PHONE	N/A
ONLINE	cpcommander.sourceforge.net
MARKET	Prosumer
PRICE	Free (GPL)

✓	Secure encryption and deletion of files.
★ ★ ★ ★ ★	VERDICT
✗	Installation; weak file manager; GUI requires more polish.



In the Options menu you can select the preferred file-removal (wipe) mode.



The Do menu helps you to operate on files and create new encrypted archives.

HP dx5150 SFF Desktop PC

HP gets down to business with AMD.



Intel has long been the master of the corporate PC world. With guaranteed supply lines and a great price point in bulk, having a Pentium CPU in a business desktop has been the build for the past five years.

HP's broken the mould with this one; the new dx5150 business desktop uses AMD's Athlon 64 X3000+ CPU on an ATI Radeon Xpress 200-based motherboard. Also in this small form factor desktop case is a plain-Jane CD-ROM from LiteOn, 512MB of DDR400 RAM and an 80GB Western Digital WD800JD hard disk drive. Though this build may

sound a little so-so to most enthusiasts, it represents excellent performance for a corporate machine. Parts have obviously been chosen with reliability foremost in mind.

ATI's integrated Radeon 9600 IGP drives the graphics and, with such a relatively high-end adaptor, the dx5150 should see in the Vista age with relative comfort. The board's design also has a DVI output for use with LCD monitors. The system contains a small internal speaker for audio output, reducing the need for easily lost or damaged desktop speakers.

On the bench, the dx5150 performed as expected. PCMark05

clocked the dx5150 at 2,162, while Business Winstone 2004 awarded 20.4 points averaged over five runs. Multimedia Content Creation awarded 24.8, while 3DMark05 showed 561.

The machine is only offered with Microsoft Windows XP Professional; it would have been nice to see the 64-bit version available. The choice of the CD-ROM over marginally more expensive DVD-ROM drives is also a puzzle — the small extra amount spent could save headaches involved with distributing data on the larger optical media.

The dx5150's top to bottom screwless design makes servicing desktops in the field a simple task. If there is a major problem, HP offers a three-year limited warranty, including one year labour on site.

Nick Race

CONTACT	HP
PHONE	1300 305 017
ONLINE	www.hp.com.au
MARKET	Business
PRICE	\$1070

✓	64-bit capable; tool-less; great business performance.
★ ★ ★ ★ ★	VERDICT
✗	CD-ROM; no 64-bit operating system offered.

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Sonos Digital Music System



Music streaming has never been so easy.

For musical puritans who put their trust in the quality of hi-fi equipment instead of computers, the Sonos Digital Music System could cause a crisis of faith.

The Sonos is a multi-zone audio system which unleashes your digital music collection without leaving you at the mercy of a computer. It can stream music from your PC — or network storage or the internet — to up to 32 “ZonePlayers” spread throughout your home. Each ZP100 ZonePlayer is a stereo amplifier with speaker-wire bindings, offering 50W RMS per channel and a subwoofer jack. They also have stereo analogue outputs for connecting to an external amplifier, plus stereo analogue inputs for hi-fi gear.

The Sonos starter kit includes two ZP100s and a CR100 wireless controller for \$2,399 (or they sell separately from \$999 and \$799 respectively, so you can add rooms later). The \$699 ZP80 ZonePlayer, due locally around May, is



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.. MARKET Everyone
.. PRICE \$2,399

✓ Multiple zones; great sound quality.
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✗ One feature requires a computer.



PASSIVELY COOLED, ZONEPLAYERS LOOK SEXY BUT THE SHOW STOPPER IS THE WIRELESS CONTROLLER

designed to connect to a home theatre amplifier and has analogue and digital connections, but no built-in amplifier.

Also hiding at the rear of each ZonePlayer is a four-port 10/100 Ethernet switch for connecting the first ZonePlayer to your home network. Subsequent ZonePlayers create their own private wireless network. They only need a power point and speakers, so you can place them in those hard-to-reach places — where they can provide Ethernet access as well.

Passively cooled with Mac-like styling, the ZonePlayers look sexy but the show stopper is the wireless controller. Complete with a 3.5in colour display and iPod-like wheel, the controller is a thing of beauty and a talking point at dinner parties.

You can use the controller to play, queue and shuffle music — viewing album art and track information — as

well as create playlists. It hibernates when not in use, but you can't lock it — so keep it out of the wrong (little) hands. The system handles multiple controllers and, for another \$99, you can pick up a matching (wall-mountable) charging cradle.

The Sonos system can also be controlled from a Windows 2000/XP or Mac OS X box, which is used to nominate shared music folders. This can also be done using the controller, so Linux users are still in the game.

When we finally buy our dream computing device — an A5 slimline slate PC — the software means it should be able to control a Sonos system. Meanwhile, we'd like to see a built-in infra-red port and learning remote control in the Sonos controller, so we can use it with all of our AV gear.

The Sonos gear not only looks like a Mac, it also behaves like one. Plug it in, press two buttons on the front of each ZonePlayer to wireless network it

and you're away. No configuration, no inch-thick manuals, no tears.

Supported formats include MP3, WMA, AAC, Ogg Vorbis and FLAC, as well as uncompressed WAV and AIFF files — along with iTunes, Windows Media Player and M3U playlists. It won't play DRM-protected WMA and iTunes files, but the Sonos system regularly downloads firmware upgrades with new features. Meanwhile, you can connect your iPod to the stereo inputs and stream the output to any room.

The controller can also access internet radio and the Audible.com audio books service — without a computer running. You will need to boot up a Windows box to use online music subscription services like Rhapsody (www.real.com/rhapsody), after which you can access them from the controller. Rhapsody offers unlimited access to thousands of albums for only US\$9 a month,

including new releases — which can also be downloaded to portable devices. Rhapsody is currently only available to those with US credit cards, but if you can overcome this hurdle the service works in Australia.

Combine a Sonos system with Rhapsody and broadband and suddenly “buying” music — even online — seems pointless. Even stealing music is more hassle than searching for a track on Rhapsody. This kind of business model, for both audio and video, is the industry's last best hope of bringing lounge-room pirates back into the fold.

The System comes across as a luxury, but it grows on you quickly. It seems expensive until you consider what it can do. Sure, you could cobble something together for less but it wouldn't be as elegant or as stable (nor offer such high sound quality — features worth paying a premium for).

We're holding our breath to see what Sonos does next — a Digital Video System combined with an online video subscription service would be to die for. Meanwhile, even the puritans have to confess it takes home audio out of the Dark Ages.

Adam Turner

Socket Cordless 56K Modem

Is the modem dead? Not yet, according to Socket.

While broadband internet might be increasing in popularity, dialup is still widely used. In many places, it's the only form of access, and even net-savvy travellers have to drop back from Wi-Fi connections sometimes.

Socket Communications are well known in the PDA business for delivering accessories that support road warriors. Their wireless modem uses Bluetooth to connect to a computer or a PDA. Being a Class 1 device, it has a 100m range (but this varies with obstacles). On the upside, if you can't get broadband, this means you can have a dialup connection that isn't tied to a specific room with a phone point.

Powered by a 900mAh Lithium-ion cell, the modem doesn't even need a power supply. The unit is very small (about the size of a deck of cards). There is a power supply

for recharging the battery, and a carry pouch and retractable phone lead in the box (the only thing you'll need to add is a dialup account).

Setup was painless. There's an accompanying CD that bears a "run setup before installing the hardware" message — but there's no need to worry. The CD has drivers for a number of different Socket modems, but isn't needed for the Bluetooth model. The generic modem driver provided by Windows XP and Windows Mobile will do the job.

With our Windows XP test system we used the Add Bluetooth Device Wizard. It was able to find the modem in a few seconds. Once we entered the security

passkey, found on a small sticker on the modem, we were good to go.

Windows Mobile devices were just as easy — the only trick is that you need to tell them that you're installing a phone and not a modem. With Palm devices you'll need to download the Phone Link Updater from Palm's support site and set the Socket Modem up as a generic modem.

At over \$200 this isn't cheap, but it does work well — and might be the perfect product for a niche group of users.

Anthony Caruana

CONTACT	Brightpoint
PHONE	1300 300 213
ONLINE	www.socketcom.com
MARKET	Mobile
PRICE	\$230

✓ Small; no strings; range.

✗ VERDICT ★★★★★

✗ No documentation.



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Surveillance cameras

If you need to keep an eye on things when you're not around, video surveillance is becoming an easy way to remotely keep tabs on the situation. *Adam Turner* checks out what's available on the market.

Whether you want to check on a sleeping baby or keep a look out for thieves, surveillance cameras and digital video recorders are now simple to set up and to access from afar. Like most technologies, you can spend less than \$100 on a basic setup, or thousands of dollars on a full-blown network. The key is to decide what you want to watch, why you want to watch it and how you want to respond if something interesting happens.

Surveillance cameras come in two main types; CCTV (Closed Circuit Television) cameras which run over video cables, and IP (Internet Protocol) cameras which run over data links such as Ethernet or ISDN. Both can also run over wireless, but the security implications mean that most people choose to hardwire their surveillance cameras.

CCTV cameras are the easiest to set up because they're just AV devices without any onboard smarts. They often use BNC or RCA video plugs so you can connect them to any video device, such as a TV or VCR. They also need power, but some systems eliminate the need for two cables by running separate power and video wires through one cable, with separate power and video plugs on each end (easier to install in hard places too).

More advanced CCTV cameras come with manual zoom and focus rings. Pan Tilt Zoom (PTZ) cameras can be controlled remotely but require connection to compatible recorders.

IP cameras usually require some configuration (but offer more flexibility), such as Power over Ethernet (to reduce cabling) or built-in web servers and storage, meaning you have access from anywhere over the web.

Most video surveillance systems save on storage by only recording a few frames per second (or when something moves). As CCTV cameras are dumb terminals, they have to be connected to an analog or digital video recorder. DVRs record to a

hard drive instead of tape, making it easier to store, search and remotely access recordings. Your PC can act as a DVR and capture video from either CCTV or IP cameras.

While many USB webcams come with basic video surveillance software, dedicated surveillance cameras usually provide better optics.

Swann's Digital Guardian DVR is a PCI card which allows you to connect four CCTV cameras to your computer, recording the video to your hard drive. We put it to the test using Swann's CCTV Security Camera 4 Pack (\$799). This includes two weather-proof

"Bulldog Cam" colour cameras (which also offer up to 10m of infrared vision) and two C500R cameras with

MOBOTIX'S M10M CAMERA

inter-changeable lenses. The C500R offers advanced settings such as back-light compensation.

Installing the PCI card and the software (Windows 2000/XP only) is very simple — the hardest thing is running the cables and positioning the cameras. Each camera comes with an 18m dual power/video cable. The four BNC video jacks connect to the PCI card (the four power jacks to one power supply).

The Digital Guardian software isn't much to look at, but it's surprisingly flexible — capable of controlling up to 16 cameras using four PCI cards. You get the same view as in-store surveillance — all the cameras at once or cycling through every few seconds. The software can also remotely control PTZ-compatible cameras.

Video is recorded in MPEG4; you can vary the bit rate and frames per second. If you run out of drive space you can record over old recordings or spill onto a new partition.

Brightness and contrast are adjustable, recordings can be scheduled (or respond to movement), and sensitivity can be adjusted. Also, the Digital Guardian can trigger an audible alarm and email you a snapshot of any action. Back at home, you can search through the video according to variables such as time and event, zoom in, freeze the video, adjust the image and print your wanted poster.





SWANN BULLDOG CAM

53



VENDOR	MODEL	PRICE	ONLINE	PHONE
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2. ASUS	A6Ja	\$3,199	www.asus.com.au	1300 278 788
3. Fujitsu	S7110	\$2,999	www.lifebook.com.au	1800 288 284
4. HP	dv1610TN	\$1,999	www.hp.com.au	1300 305 018
5. LG	P1 Express Dual	\$2,499	www.lg.com.au	1800 725 375
6. Samsung	X60	\$3,099	www.samsung.com.au	1300 369 300
7. Sony	VAIO VGN-FE18GP	\$1,799	www.sony.com.au	1300 138 246
8. Toshiba	P100	\$3,410	www.isd.toshiba.com.au	13 30 70

**THE
players**



Hard-Core DUEL

Dan Chiappini, Nick Race and John Gillooly pull out the Lab coats and dissect a sample of new Core Duo notebooks.

Unlike the launch of many new technologies, a large number of vendors had Core Duo notebooks ready to go the same week Intel announced the new platform. This trend of “hot launches” is a positive movement in the IT market. All too often in the past, announcements were made but users were kept waiting for weeks — or even months — before the product was available for sale.

APC rounded up eight big names in notebooks with purposeful zeal — to test the implementation of Intel’s new Core Duo platform by trusted and proven notebook vendors.

APC requested notebooks with a focus on multimedia capabilities for the first Core Duo Labs Challenge. Multimedia notebooks are the first major focus of the notebook vendors; this is fitting, as multimedia tasks are one of the major areas of computing that can take advantage of dual or multicore

technology right off the bat (due to their tendency to drive the CPU to capacity when encoding or decoding video and audio). The majority of the notebooks submitted included at least basic multimedia functionality, most often in the form of media-control buttons, remote controls and media playback software.

When the results started coming in, we were surprised by the range of designs, with some systems turning out huge battery performance, and others designed solely for speed. Considering the youthfulness of the platform, we expected similar results, as we assumed most vendors would still be running close to Intel’s reference designs. In hindsight, notebook vendors have been working with the platform for a number of months to implement their own design, so such varied results and implementations did make sense.

As previously mentioned, APC

eight
NOTEBOOKS TESTED



WE WERE SURPRISED BY THEIR
RANGE — CONSIDERING THE
YOUTHFULNESS OF THE PLATFORM



noticed a huge trend towards the home user. As business-focused systems work on a much longer product cycle for support and replacement, it stands to reason that the much quicker-moving home user and enthusiast markets would be serviced first. Businesses need a lot of convincing before investing potentially millions of dollars on a first-release platform.

There were two major vendors who were unable to supply us with notebooks for the round-up. Lenovo's IBM-branded ThinkPad is noticeably missing due to delays in supplying a model (although, as the unit is not multimedia-based, but rather a business notebook, it would have been ineligible for an award in this Labs Challenge). Dell



THE MAJORITY OF THE NOTEBOOKS SUBMITTED INCLUDED AT LEAST BASIC MULTIMEDIA FUNCTIONALITY

is also missing from the line-up, due to last-minute changes in the specification of their Core Duo model. As such, and unfortunately, Dell was unable to supply a unit in time for acceptable testing and had to bow out of the competition. The last-minute changes by Dell are a surprise, but far from unheard of in the industry.

BALANCE OF POWER

Before we get to the tests, it's important to understand the goal

behind this new dual core direction for notebooks. Common sense dictates that two processors will consume more power than one. Therefore, at first glance, one wonders why dual-core notebook computing has suddenly switched from the fringe to the mainstream. Both AMD, with its upcoming Turion 64 X2, and Intel, with its recently released Core Duo, are making the move towards dual-core mobility. They are able to do this thanks to architectural and

manufacturing improvements that are making this new generation of processors much more efficient than their desktop counterparts.

Mobile processors are designed around trade-offs between power and performance. Technology such as Intel's SpeedStep and AMD's Cool'n'Quiet are designed to throttle back CPU performance when a notebook PC is performing non-computationally intensive tasks. However, new-generation power management goes well



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- MOTHERBOARD: FLEX ATX/ MICRO ATX
- POWER SUPPLY: ATX (12CM FAN RECOMMENDED)
- FRONT I/O: 2 USB / EAR-PHONE / MIC / 1394



DUAL-CORE NUTS AND BOLTS

Multithreaded computing is not a new concept — at least on the desktop, where it has been around since the Pentium Pro and has enjoyed more than a good run.

Hyper-Threading put a new spin on the idea and allowed multiple streams of computation on one physical core. The first iteration of dual-core in single packaging came with two independent 1MB caches, but has now evolved into two physical execution cores and a single 2MB unified and dynamically resizable cache.

Other innovations such as Intelligent Power Capability help turn on only the required logic subsystems

parts as they're required, allowing other parts to remain asleep or in low-power consumption mode (and conserve battery power).

This feature alone is important before being mixed with technologies such as Smart Memory Access and, specifically, Memory Disambiguation (the general gist of which means it allows for better guessing at out-of-order processing pre-fetch data before anything is executed — by examining dependencies ahead of time). It's educated guessing, but the intelligent design of this system — combined with a shortened pipeline — means less recovery time when a pre-fetch is incorrect or fails mid-pipe.

Intel's Advanced Digital Media Boost is another improvement to the micro-architecture of Yonah and improves SSE across the board by reducing the number of instructions required to launch tasks. SSE3 is also a new addition to the chip which, combined with the floating-point tweaks already mentioned, make Napa an even better contender for your love when it comes to multimedia manipulation including video, photos and audio — but not leaving encryption, financial and scientific usage out in the cold.

Yonah is Intel's first crack at 65nm chips and the associated die-

shrink means it doesn't run as hot — while only piling around another ten million transistors on for the second core. The majority of the 151 million transistors used are for the massive 2MB L2 cache.

Don't believe all the hype though; despite the Napa platform's marketing as being Core micro architecture, it won't be until Merom ships towards the second half of this year that chips based on the new design will begin to become available.

Until then, we're more interested in seeing multicore and Hyper-Threading-enabled dual-core products and the performance gains they'll bring to the table.

beyond this simple clockspeed throttling and dynamically changes a CPU's power supply to squeeze battery life out of a notebook.

In order to increase the viability of dual-core mobile computing, such technology has been extended and refined. One such example is evolving the way cache memory is designed. Unlike Intel's current desktop dual-core offerings, which are essentially two CPUs joined together on the same package, the Core Duo uses two processing cores that share 2MB of cache. When the processor enters a sleep state, the entire cache is flushed to system memory and, once the data is gone, the



IN THE NEXT YEAR, EXPECT TO SEE MUCH MORE RELIANCE ON GRAPHICS PROCESSORS

transistors in the cache turn off. By unifying the cache, Intel is also able to avoid the need to move data between processors over the frontside bus, which also allows for increased power savings.

Another prime example is an extension of SpeedStep's scaling back of processor frequency to match the processing load. Each core on the Core Duo processor is capable of independent power

scaling. This means that if, for example, only one core is needed for the tasks being performed, the other core will be able to enter a very low-power, deep sleep state until it is needed again.

Another key to the power-management strategy is extending the technology to the chipset and allowing it to also enter sleep states. In fact, one thing we noticed in testing the Core Duo notebooks

is that systems with Intel's integrated graphics show significantly less power consumption (and really cruddy 3D performance).

The drawback with dual-core is, of course, that when both processors are being used to their full potential, the battery drain is higher than an equivalent single-core system. An understanding of this fact is important if you plan on performing processor-intensive tasks like rendering, gaming or digital video — be prepared for battery life to suffer accordingly.

But CPU power drain is only a small part of the battery-life equation. Screen backlights and discrete graphics chips both drain significant amounts of power. In the next year, expect to see much more reliance on graphics processors in particular, as Windows Vista makes use of them to render its Aero Glass interface. Further, it goes without

MODEL	3DMARK	PCMARK	BUSINESS WINSTONE	MULTIMEDIA	BATTERYMARK
	0 4,000	0 4,500	0 25	0 35	0 7:00
ASUS	3,517	4,127	24.2	32.6	6:07
Samsung	2,290	3,550	22.9	27.6	4:11
Sony	1,736	3,543	21.5	26.7	4:05
Toshiba	1,658	3,376	19.6	26.2	3:40
Acer	1,028	3,222	19.5	25.9	3:12
HP	98	2,052	19.2	25.6	2:31
Fujitsu	58	2,000	18.8	24.8	2:27
LG	51	2,010	16.2	20.8	1:15



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Core truths: systems using Intel's integrated graphics solution show less battery consumption (but offer lousier 3D performance).

saying that gaming on a notebook will make an impact on battery life, especially with the impending appearance of dual-graphics chip SLI notebooks and high-end mobile cards like the GeForce 7900 GTX mobile part which was recently announced by Nvidia.

In this timeframe, also expect to see even more power savings on the CPU side as Intel launches Low Voltage (LV) and Ultra Low Voltage (ULV) versions of the Core Duo chip. These will most likely appear in thin and light notebooks, avoiding the battery-draining additional components seen in the current range of multimedia-focused models. When these CPU models

appear we expect to see significant savings in power drain and new records set for battery life.

AMD is yet to lift the lid on its answer to Intel's solution. Called the Turion 64 X2, it will be a dual-core variant of AMD's existing notebook line. So far it has been confirmed that the CPU will support DDR2, be of the same power consumption as the current Turion chips and will be launched alongside an SLI-capable notebook chipset from Nvidia.

HOW WE TESTED

Each notebook was run through our standard notebook benchmark suite. General performance was gauged using Futuremark's

PCMark05, which quickly tests the platform's hard disk, memory, multitasking and graphics performance with simultaneously-run tests to stress dual-core or multi-CPU platforms. As the majority of notebooks submitted also used a third party (non-Intel) 3D graphics adaptor, 3DMark05 was also run to compare the relative performance of the mobile graphics chipsets in each system.

A productivity score was recorded using Business Winstone 2004, while the machine's multimedia-creation abilities were gauged using Multimedia Content Creation Winstone 2004. Lastly, the system's battery life was

established using BatteryMark 4.0.1, which runs CPU and hard disk-based subroutines on the notebook until the battery is exhausted. BatteryMark is run multiple times and the best score is taken. All battery life tests were run with the notebook's display on its dimmest setting and with Wi-Fi turned off. The top three battery scores were also subjected to a DVD test; with audio and screen volume at moderate settings, all notebooks completed a playback of a full DVD on battery power.

THE CONTENDERS

Multimedia-centric notebooks tend to be a strange beast. The order of

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the day is Instant-On-type applications that let the user play video or audio using a microkernel, without booting the full operating system. This is great, as it's quick, effective and presumably uses a little less battery power (as it avoids extra CPU cycles keeping the OS and background applications running). The downside is that once your movie is finished, you still need to boot the notebook anyway. The multimedia-specific capabilities of the models differed dramatically, with some much closer to general/home usage than entertainment.

HP's dv1610TN notebook was definitely on the right path as far as multimedia and general usage is concerned. A 14in wide-screen XGA bright display is powered by Intel's GMA 950 integrated adaptor atop a T2300 1.66GHz Core Duo processor. The dv1610 comes with 512MB of 533MHz DDR2, an 80GB hard disk drive and a LightScribe-enabled 16x DVD+-RW. It features a full set of media controls along the top of the keyboard, as well as a quick launch button to access HP's media centre-style application. A remote control is included and can be slotted into the ExpressCard slot for storage. The dv1610TN has a one-year parts and labour warranty.

LG submitted their P1 Express

Dual model, featuring a 15.4in wide-screen with a bright finish, a T2300 Core Duo, 512MB of 667GHz DDR2 and an 80GB hard disk drive. The P1 also includes a slimline version of LG's GSA4082 Super Multi DVD drive, supporting +R, -R and RAM rewriting. There's no third party graphics accelerator; the LG unit relies on Intel's GMA 950. Mounted above the keyboard is a button to launch a media player (PowerDVD 6, included with the notebook) and a button to enable or disable SRS sound enhancement. The P1 also includes a fingerprint scanner for automated log-in and security purposes.

ASUS graced us with an AJ6a notebook, fresh off the line. Featuring a T2500 2.0GHz Core Duo, 2GB of RAM and a Mobility Radeon X1600, it's chock full of the latest and greatest in mobile technology. This multimedia content-focused model is heavy on the specs (and also in your bag). The 15.4in wide-screen XGA display has a bright finish and the unit features a full multimedia control panel below



I wanna hold your hand:
LG's P1 packs a fingerprint scanner for automated log-in and security purposes.

NAPA'S NEW WIRELESS

Centrino means a lot of different things to different people. To Intel, it was a major component of its platformisation strategy and of making Centrino a buzz word and household name. Wireless networking is not a new technology, but it took Intel certifying it as a part of a bigger picture to get the mainstream-adoption ball rolling in mobile devices. The number of notebook models that will ship with wireless modules this year will undoubtedly be more than not — and help make pervasive networking more than a pipe dream.

When Intel launched Centrino, it had the foresight to include not only the 802.11b standard, but also the more-recently-

ratified 802.11g spec, adding range and data throughput from 22Mbit to 54Mbit of theoretical bandwidth.

So where do you go from there when you need to launch the next generation? The release of Sonoma saw a new PRO/Wireless module, the 2915ABG (Calexico 2), a tri-band device adding the only missing 802.11 standard not already on board, namely the "a" spec.

The release of Napa included a refresh of the wireless module as well as the CPU and chipset, and the PRO/Wireless 3945ABG was born. Intel has worked out the kinks and this piece is now considerably smaller than its Calexico 2 counterpart — and helps to further reduce the weight and size of this series of notebooks.

The PRO/Wireless 3945ABG has a few new tricks up its sleeves as

well, adding 802.11e QoS (Quality of Service) to specifically prioritise for VoIP softphone applications. Wake-on-WLAN support and LEAP, EAP-FAST and CKIP Cisco-compatible extensions. Intel's new PROSet/Wireless software now also has a nifty feature called Optimal AP Selection Technology — which helps to load-balance across access points and improve data throughput from demanding applications such as VoIP.

Come six months from now when Merom (Yonah's successor) is starting to get some press, we'll be interested to see if the new kid on the block has support for 802.11n. Given Intel's crusade to bring the next big thing to market, we wouldn't be at all surprised if it was bundled as part of the wireless module of choice.



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the touchpad. The AJ6a is equipped with a 100GB Hitachi hard disk drive plus a 16x DVD+-RW. Also, a 1.3 megapixel webcam is installed for video-talk applications.

Toshiba's snazzy-looking P100 model entered the fray sporting a T2400 Core Duo at 1.83GHz, plus 1GB of DDR2. A Toshiba-branded 100GB hard disk drive and a 16x DVD+-RW slimline drive constitutes the storage. The P100 has a beautiful-looking 17in wide-screen running at 1,440 x 900 and driven by an Nvidia GeForce Go 7300, inbuilt multimedia control buttons along the top of the keyboard, a fingerprint scanner plus speakers by Harman/Kardon.

From Fujitsu we received an S Series 7110, a T2300-based unit with 512MB RAM, a 14in XGA 4:3 ratio screen, a Fujitsu 80GB drive and a DL Super Multi DVD burner. This model uses Intel's GMA 950 internal graphics. The 7110 has four customisable buttons on the top edge of the keyboard plus a fingerprint reader built between the two touchpad buttons.

Submitted by Acer was its Aspire 5670 beastie, equipped with a T2300 running at 1.66GHz and 1GB of DDR2 memory. It sports a 15.4in WXGA CrystalBrite screen driven by an ATI Radeon X1400, a 100GB 5400rpm SATA hard disk drive and a double-layer super-multi DVD burner. The 5670 includes a rather nifty Bluetooth

phone handset which stores neatly in the PC Card slot in the side of the unit. It includes multimedia buttons down the left-hand side of the keyboard for quick access. A 1.3 megapixel camera rounds out the extras.

From the Sony camp, we received a VAIO VGNFE18GP, which features a 15.4in WXGA wide-screen and an extremely svelte waistline. This model includes a T2400 1.83GHz Core Duo, 512MB of RAM and a 100GB SATA disk drive. A double-layer DVD+-RW drive and an Nvidia GeForce Go 7400 finish off the inside specs. The unit has no multimedia function keys but has two programmable buttons on the top left of the keyboard.

Last, but certainly not least, Samsung's X60 (a more powerful version than the model we inspected in APC March, page 38) was put on the bench. This T2300-based unit with 1GB RAM also sports a 100GB Fujitsu hard disk drive, a Teac 16x DVD+-RW and a Radeon X1400 driving a 15.4in wide-screen WXGA glossy display. The X60 has a slot-in remote and includes AVS Now instant media player.

BATTERY LIFE

When all was said and done, we noticed a single huge trend in the notebooks tested. Those notebooks with third party graphics cards from Nvidia and ATI

DUAL-CORE CHIPSETS

A new generation of mobile processors represents the progression of a new range of mobile chipsets. If you're buying an Intel-based dual-core notebook, you'll get one of two flavours: either the 945GM or 945PM Express chipsets. Both have been designed from the ground up to support the new Core micro-architecture and cover variations from the brand-spanking-new Core Duo and Solo chips, Ultra Low Voltage (ULV) and Low Voltage (LV) all the way down to Core Solo ULVs and the Celeron M series.

Feature-wise, the two models are almost identical — both use a 667MHz frontside bus (FSB), which has been upped from Dothan's 533MHz and matches Yonah's 667MHz DDR2 memory support.

Single and dual-channel memory are supported by the chipset up to 4GB of memory; given the Napa platform's performance focus, we can expect to see a few of the major league notebook players releasing multimedia and gaming systems designed at maximum spec.

The main difference between the 945GM and PM variants boils down to whether users are after basic Intel GMA 950 integrated graphics or if they'd like something with a bit more grunt. In the case of the latter, they can grab one of the Nvidia or ATI



products being offered that have been specifically designed for that chassis and its associated thermal envelope.

The staple features remain and, regardless of which option you choose on the graphics front, both chipsets ship with Intel's High Definition Audio (HDA) with its 24-bit, 192KHz decoder and support for up to eight USB ports.

Power management is taken care of as a two-pronged attack, both on a silicon level with the Yonah CPU micro-architecture and on a board level. The new chipsets both help to maximise battery life by offering an enhanced Intel SpeedStep function and a deeper sleep power mode. It's a bit of a symbiotic relationship, with the CPU reliant on the chipset to achieve some of the power advantages of the new architecture, and the chipset needing features of the chip to operate.



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FUELLING MOBILITY — NEXT GEN BATTERIES AND FUEL CELLS

Most notebook PCs use batteries based upon Lithium-Ion (Li-Ion) technology, although some manufacturers are beginning to use more advanced Lithium-Ion Polymer (LiPo) technologies in their batteries.

Li-Ion was first commercialised by Sony in 1991 and has become the most commonly used battery technology in notebook computing. Li-Ion batteries are constructed of cells — rigid metal tubes inside which sit some relatively nasty chemicals such as an organic solvent. While this is safe unless you pierce the battery, the need for metal tubing increases the weight of the battery.

LiPo batteries avoid this by replacing the liquid solvent component with an organic polymer.

This makes for batteries that are more stable and much lighter in weight thanks to the lack of need for metal cell casings. It also means that the cells can be more densely packed than in Li-Ion batteries, which allows manufacturers to squeeze more power out of a same-sized notebook battery. Apple's MacBook Pro is the most high-profile example of LiPo technology being used in notebooks.

However, the future of mobile computing power lies outside the realm of Lithium-based battery cells. Work has been slowly progressing for several years on fuel cells, and we are beginning to now see the first commercialisation of fuel cell technology. While fuel cells have been used ever since the Apollo space missions, taking such technology and packaging it in a

usable form for notebook computers involves several significant hurdles.

Whereas batteries are a closed system, with all the chemicals sealed inside the battery itself, fuel cells take an external fuel source (hence the name) such as hydrogen and combine it with oxygen to produce electricity. The by-product of this reaction is clean H_2O .

However, one of the major stumbling blocks in commercialising fuel cells is that while the output is just water, the fuel is often highly unstable and difficult to store. This has caused many concerns, especially among the aviation community, for the safety of fuel cell-powered devices.

This has led to the preference for fuel cells — for electronic devices — that use methanol as a fuel source,

as it is a much more stable fuel to transport than hydrogen.

Such industries are starting to meet fuel cell makers half-way; it was recently announced that come 1 January 2007, the International Civil Aviation Organization (ICAO) will permit passengers to carry fuel cells based upon butane, formic acid, direct methanol or reformed methanol on international flights.

In conjunction with this, the International Electrotechnical Commission (IEC) is working on safety standards for fuel cells carried on aircraft.

This breakthrough should lead to the first commercialisation of fuel cell technology; several companies are now readying methanol-based fuel cells for mass production in early 2007.



IT SEEMS THE MAJOR TRADE-OFF THEN IS BETWEEN 3D PERFORMANCE AND LASTING BATTERY POWER

outperformed the models using Intel's integrated graphics, but with a catch. Notebooks using the third

party graphics suffered from much lower battery life — sometimes to the tune of half of the Intel-powered models. This can be seen especially with Samsung's X60 unit,

which APC tested at the time of Core Duo's launch. In our original testing, the X60 using Intel's graphics lasted five hours, 44 minutes, while this model using an ATI Radeon X1400 only managed three hours, 12 minutes under the same conditions. It seems the major trade-off then is between 3D performance and lasting battery power. It follows that the notebooks using Intel's GMA 950 integrated graphics topped the battery-life list. In this regard, LG's LifeBook was by far and away the leader, lasting six hours and seven minutes, followed a long distance behind by Fujitsu with

four hours, 11 minutes and HP with four hours, five minutes. These top three performers also went through some extra testing, running the DVD movie *Run Lola Run* with screen brightness and audio volume set to medium levels. All three notebooks saw the movie out to the end but, conversely, all three needed a charge right away to continue running for long.

Sony and Samsung came in next with three hours, 40 minutes and three hours, 12 minutes respectively, while Acer and ASUS came in at a similar 2:31 and 2:27. Toshiba suffered under the weight of its 17in screen with a dismal one hour, 14 minutes battery life.

Though the Centrino Duo platform does offer an improvement over last-generation Sonoma models, the ultimate battery life of each model is still strongly dependent on which hardware the manufacturer



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CORE DUO GOES ULTRA-PORTABLE

Mobile processors are designed around power management. A mobile CPU such as an Intel Core Duo or AMD Turion already drains less power than its desktop equivalent, but processors can be further tuned to use even less power than this. Such CPUs are categorised as Low Voltage (LV) or Ultra Low Voltage (ULV) depending upon their power consumption.

These are the processors destined to appear in thin and light computing offerings, such as Tablet PCs and ultraportable notebooks. They often work at a lower clockspeed and use a lower speed chipset than standard CPU models, sitting inside chassis designed to maximise battery life — without throwing too much performance away. In fact, the UMPC concept design unveiled by Intel uses a ULV version of the Dothan-core Pentium M CPU running at 1GHz.

There is no hard and fast definition of what constitutes a low voltage CPU: instead it is more a way of segmenting the market. In the previous-generation Centrino notebooks based upon the single-core Dothan CPU design, standard CPUs ran at 27 watts, LV models 10 watts and ULVs at 5.5 watts.

As part of the Core Duo launch, Intel unveiled four models of "normal" Core Duo, which consume 31 watts of power. These models are prefaced with the letter T (eg. T2500) and have been shipping since the announcement. However, Intel also announced two other models of Core Duo, the L2300 and L2400, which are low-voltage versions of the CPU. These are targeted at a lowly 15-watt power drain, half that of the normal Core Duo chips. At the time of writing, these LV Core Duo processors still hadn't shipped to market.

Intel has yet to announce the specifications of the planned ULV variant of the Core Duo, and we do not expect to see these processors enter the market until later this year. These should be targeted at 9 watts of power consumption.

At first glance it looks like the new generation of LV and ULV CPUs consume more power, however, when you take into account the fact that these processors have two cores to the Dothan's one, the picture becomes a little different — and the large power savings inherent in the Core Duo become even more apparent.



LV or ULV?
That is the question.

decides to use, the size of the screen and, of course, the capacity of the battery. Though the Intel GMA 950 models are all closer to the full work-day battery life, once you add optical-drive use, Wi-Fi and the occasional hibernation (or shutdown/startup routines), the goal recedes further into the horizon.

PERFORMANCE

As a whole, these notebooks are powerful. The addition of a third party display adaptor from Nvidia or ATI adds an extra level of performance which the stock units are lacking. The ASUS notebook traded off its battery life for top results in every other tested category. With scores of 3,517 in 3DMark, 4,127 in PCMark, 24.2 in Business Winstone and 32.6 in Multimedia Winstone, the combination of the fastest CPU, the most RAM and the hardest-hitting graphics adaptor proved to be a success. The ASUS AJ6a runs like a demon — but drops like a stone once it's untethered.

Samsung earned second-place scores in both 3DMark and PCMark benchmarks, but scored middle of the pack for the Business and Multimedia Winstones. Sony picked up a consistent third in PCMark and 3DMark tests while hovering around the same scores as the Samsung in the Winstone results. Both Toshiba and Acer earned a second place in Business and Multimedia Winstones respectively, while LG and Fujitsu were consistently poor performers thanks to the stock Intel GMA 950. HP did not fare much better, staying in the bottom three for all performance benchmarks.

MULTIMEDIA PIZZAZZ

All the units on the bench — bar the Fujitsu — have a good multimedia pedigree. HP's proven track record with screen quality, integration of playback tools and high quality audio stays true, with the dv1610 looking and sounding like a million dollars.

Toshiba's P100 is also a great example of this kind of model; the bright wide-screen, integrated controls and excellent sound set it aside as a model with which you can just as easily relax on the couch or type a word document.

Acer, Sony, ASUS and LG all sit in the middle ground, with either a mediocre screen (ie. the ASUS) or unexciting audio like the Acer and LG. Though Sony's LCD panel is absolutely gorgeous, the notebook has been tailored more as a multimedia content creation unit, rather than for playback enjoyment.

THE VERDICT

Clearly, the performance winner of the bunch was the ASUS AJ6a notebook — blowing away the competition in every benchmark. The combination of the T2500 2GHz Core Duo, the ATI Mobility Radeon X1600 and a huge 2GB of RAM created a mean machine which was impossible to beat. It's not perfect though — the powerful hardware taxes the ASUS' battery, leaving it with a paltry two hours, 27 minutes of charge; an extremely conservative usage model.

Conversely, one of the consistently least powerful notebooks, the LG P1 Express Dual, showed a long six hours and seven minutes of battery power. Though it's certainly not a record breaker, the performance of these units is relative, and the P1 will still give you decent performance for your money (except if you play 3D games).

The Samsung X60 with its ATI Radeon Mobility X1400 just about hits the middle ground between battery life and power, but awarding what is essentially a mediocre performer in both fields is unacceptable. In the end then, we have decided to not award an Editor's Choice to any notebook; however, the ASUS, LG and Samsung notebooks all receive APC's Highly Recommended award. **APC**



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www.infinitycomputer.com.au

Sales
Service



	ACER	SAMSUNG	SONY	HP
CPU	T2300	T2300	T2400	T2300
Clock Speed	1.66GHz	1.66GHz	1.83GHz	1.66GHz
RAM	1GB	1GB	512MB	512MB
Hard Disk Drive	100GB	100GB	100GB	80GB
Optical Drive	DVD±RW DL	DVD±RW DL	DVD±RW DL	DVD±RW DL LightScribe
Screen Size	15.4in	15.4in	14in	14in
Aspect Ratio	Wide	Wide	Wide	Wide
Native Resolution	1,280 x 800	1,280 x 800	1,280 x 800	1,280 x 800
Graphics Adaptor	ATI Radeon Mobility X1400	ATI Radeon Mobility X1400	Nvidia GeForce GO 7400	Intel GMA 950
USB	4	3	3	3
Wi-Fi	802.11a/b/g	802.11a/b/g	802.11a/b/g	802.11a/b/g
Bluetooth	Yes	Yes	Yes	Yes
Weight	2.95kg	2.48kg	2.8kg	2.44kg
Dimensions (HxWxD)	28 x 364 x 275	23.9 x 361 x 265	35 x 366 x 274	38 x 234 x 334
				
✓	Good all-round performance	Great screen; dependable results	Excellent design; stunning screen	Gorgeous screen; great multimedia implementation
✗	Dull screen	Light on extras	Unit finish marks easily	Underpowered

Verdict

★★★★☆

★★★★☆

★★★★☆

★★★★☆

	LG	ASUS	FUJITSU	TOSHIBA
CPU	T2300	T2500	T2300	T2400
Clock Speed	1.66GHz	2.0GHz	1.66GHz	1.83GHz
RAM	512MB	2GB	512MB	1GB
Hard Disk Drive	80GB	100GB	180GB	100GB
Optical Drive	DVD±RW DL + RAM	DVD±RW DL	DVD±RW DL	DVD±RW DL
Screen Size	15.4in	15.4in	14in	17in
Aspect Ratio	Wide	Wide	4:3	Wide
Native Resolution	1,280 x 800	1,280 x 800	1,024 x 768	1,440 x 900
Graphics Adaptor	Intel GMA 950	ATI Radeon Mobility X1600	Intel GMA 950	Nvidia GeForce GO 7300
USB	3	4	3	4
Wi-Fi	802.11a/b/g	802.11a/b/g	802.11a/b/g	802.11a/b/g
Bluetooth	Yes	Yes	Yes	Yes
Weight	2.78kg	2.7kg	2.15kg	3.3kg
Dimensions (HxWxD)	31 x 355 x 261	35 x 354 x 284	25 x 306 x 248	41 x 394 x 275
				
✓	Outstanding battery life	Top performer	Great battery life	Great screen and multimedia features
✗	Uninspiring performance	Poor battery life	Performance could be better	Appalling battery life

Verdict

★★★★☆

★★★★☆

★★★★☆

★★★☆☆

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PM17TU - 17", 3ms, Multimedia



PW191 - 19", Widescreen Multimedia



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Standard



Scenery



Theater



Game



Night View



3 Skin-tone

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Colour Shine Technology

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Crystal Shine

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PUT THE NET IN YOUR POCKET

You're almost home but you really need to check some info on the net. Dan Warne tests the best information providers for your mobile.

We're at a tipping point — more and more people want to be able to access the net wherever they are; faster 3G mobile networks mean wireless internet coverage is now widespread; and mobile phone handsets are getting big screens, decent web browsers and fast CPUs (at least, compared to older phones).

Yet, browsing the web on most mobile phones is still quite a "half-baked" experience. Mobile phone screens generally top out at 320 x 240 resolution, about a third of what's required to show an average web site at full size — and half what's needed to show a cramped but readable version.

Early adopters are used to running the limitations of the bleeding edge, and the truth is, if you look hard enough, that there are phones which are a cut above the rest for accessing the net and there are information services from the mobile networks that are actually worth the money for the convenience they provide. Even if your phone is an older model with a smaller screen, you can retrofit it with new software apps to add a more capable web browser or RSS feed reader, for example.

Intel and Microsoft have spotted the gap in the market for mobile internet devices and developed what they call Ultra-

Mobile PCs (UMPCs). Prototypes attracted enormous attention at March's Intel Developer Forum in San Francisco (see page 16 for our full report). The tiny tablets are full-blown PCs in an incredibly small case (think: A5 paperback book, and we're not talking a John Grisham blockbuster) with an inbuilt screen, capable of running Windows XP or Vista. One version uses pen input, while another even smaller version due in 2007 (pictured below) uses a twist-out keyboard.

Intel says it is filling an obvious gap in the market between smartphones/PDAs and laptops: a portable internet and entertainment PC you can toss into your backpack or handbag and carry everywhere.

The target price range is US\$300-500, which puts them squarely beside mid-range mobile phones, and ASUS and Samsung are among the companies signed up to produce them. Microsoft has fine-tuned its Windows XP Tablet Edition interface to add features for UMPCs including onscreen "thumb entry" as part of a "Touch Pack". The interface also includes a Windows Media Center-style menu system for accessing online services and content on your UMPC. Vista will include all of the features of XP Tablet Edition and the "Touch Pack".

THE LATENCY PROBLEM

3G mobiles have much faster data rates — up to 384Kbit/s compared to the sub-dialup speed of GPRS on 2G mobile networks. However, the trouble with mobile networks is slow latency — the time it takes for a data packet to be sent over the radio link and then acknowledged by the other end. Unfortunately, web browsing requires a lot of "back and forth" network transfer, so slow latency makes web browsing seem sluggish. The upcoming HSDPA standard (an extension to 3G) is expected to improve on this.



Phone services compared

Ringtones and wallpapers aside, what useful information services can you get on a 3G mobile phone with each of the major networks?

If you've looked at those mobile phone ads and thought to yourself, "Who would pay \$4.95 for a ringtone?", you're certainly not alone. The inventor of the Crazy Frog must be laughing all the way to the bank. We set out to find out whether there was anything for the average jaded geek on these mobile content services.

OPTUS

Of all the services, Optus' is the most no-nonsense. The obligatory overpriced music downloads and ringtones are there but, for the more sane among us, Optus has built a software app for its 3G handsets which constantly pulls down news headlines to your phone's screen. When you want to kill a few minutes on the bus, you don't have to wait for the phone to connect and download — it's already there. That said, all you get is headlines; if you want to view the full stories you do still have to wait. You can customise the types of headlines delivered to your phone via Optus' web site (on your desktop PC) which is a breath of fresh air. Optus' other major selling point is Mobile MSN Messenger, a Microsoft-certified software app that runs on your phone and doesn't have the cost or lag of the makeshift SMS-based versions from other networks. It costs 95c a day to use or \$5.95 per month. There's an in-depth review of Optus' 3G service on our website (<http://snipurl.com/n4iu>).

TELSTRA

Telstra's 3G content service is an odd mix of two separate platforms. On one hand there's the i-mode service which has a wide array of information services that have been optimised for mainly text-only viewing (though there is some video). It's difficult to summarise briefly the breadth of Telstra's content offerings: there are 220 different i-mode sites. Most major news outlets are represented,

including ABC, *The Age*, *The Sydney Morning Herald*, Channel Seven, Channel Nine and *The Australian*. Some of the sites are free. Most others, like Hotmail, cost two or three dollars a month. Then Telstra slugs you again for data usage at \$15/MB — a steep rate. If you are prepared to commit to a level of data usage each month, you can buy 1MB for \$5, 3MB for \$10 and so

3

You can only access content on 3's own portal, not the internet. That said, there's a strong selection of unique Australian content with straightforward, decent pricing — like live broadcasts of the cricket for \$8 per month flat rate, and all the Tropfest short film finalists for 50c each. A month's unlimited access to movie guides costs \$1, TV

selection of porn on tap ranging from 50c for a picture to \$12 a month for streaming video.

VODAFONE

Vodafone live! is rather weighed down with a lot of gimmicky content that would appeal to teenagers (whose parents pay the phone bill), like \$4.50 ringtones, \$1.49-per-minute episodes of



OPTUS' MAIN SELLING POINT IS MSN MESSENGER FOR MOBILE PHONES

on — though, bizarrely, video clips are charged at the higher \$15/MB rate regardless.) Then there's Telstra's other content portal — BigPond Mobile, with a wide array of content, much of which duplicates what's on i-mode. Most items are pay-per-watch: 50c for a weather report, for example. You don't get charged for the data on these. Confused yet? So are we.

guide \$1, restaurant guide \$2 and so on.

In other words, if you want unbridled internet access on your mobile, 3's not the provider for it but, on the other hand, the content which is there is useful and entertaining — and you're not charged twice (you don't pay data charges for it). And — 3 makes no bones about it — there's a huge

"24" (these are substitute actors though; sadly Kiefer doesn't make an appearance). The most useful content is news and sport updates for \$1 per week, Fox Sports video updates for \$2.99 per month and Sky News video updates for \$2.99 per month. On the other hand, Vodafone doesn't lock you out from the internet, so if your phone has a decent browser you can surf away.



Instant messaging on your mobile could be a money-saver if it supplants SMS usage.



Retrofit your mobile

Contrary to what the phone companies might want you to think, getting email and interesting content on your mobile doesn't require the purchase of a new handset or plan.

All you need is a handset that supports running Java software and a plan that allows you to connect to the net via GPRS (for regular GSM mobile phones) or 3G. See our comparison table on page 76.

OPERA MINI

ONLINE <http://mini.opera.com>
PRICE Free

If your phone comes with a web browser that mangles web pages beyond recognition (that would be most mobiles), the free Opera Mini browser is what you need. As long as your phone can run Java apps, you can use Opera Mini instead of your phone's inbuilt browser. Point your phone's web browser at <http://mini.opera.com> and you can download the application (only 100KB — but bear in mind you will incur per-kilobyte data usage charges from your mobile carrier). If you have a way of connecting to your phone from your PC, you can download Opera Mini free to your desktop and copy it to your phone's application folder.

Apart from having a good rendering engine, Opera Mini will also save you money on your data usage costs. All web pages you access are automatically compressed at Opera's headquarters first to suit your phone's screen resolution (and to strip away content that your phone can't display anyway, like Flash, video and sound).

Opera Mini also has Google search built in.

GOOGLE PERSONALISED MOBILE

ONLINE <http://mobile.google.com/>
PRICE Free

Many phones have inbuilt email clients, but inherent limitations make them rather impractical for daily use.

For example, your data usage charges will go through the roof if your phone is checking for email every few minutes. And even if you only download email subject lines initially, it's still a slow process to receive new mail.

Opera Mobile Browser



Opera Mini™



The Opera Mini browser for mobile phones pipes pages through Opera's servers, so the grunt work of shrinking images for small screen display doesn't have to be done on your phone.

Google has come up with a great solution: the Google Personalized Mobile service lets you view a list of the most recent emails in your Gmail inbox. It's accessed through your phone's web browser, and Google keeps

everything text-only (so data usage is very light). You can reply to emails through Gmail too.

Your mobile web browser will also display the RSS feeds you've set up on your Google Personalized home page on your desktop PC.

MOBILEGLU

ONLINE www.mobileglu.com
PRICE Free

mobileGlu is a hub for piping the content of your choice to your mobile phone. It can combine your choice of RSS feeds from your favourite blogs and news sites, photos from friends' Flickr accounts, and your bookmarks stored at del.icio.us (no more painfully slow URL entry via your phone's numeric keypad...).

The software that runs on your mobile phone is only a 36KB download. It works on any phone that supports Java. A word of warning, though, mobileGlu does not currently perform any optimisation on photos downloaded via Flickr — so even when downloading Flickr's low-resolution thumbnails, you'll still be using 2-20KB per photo.



mobileGlu is a tiny Java app that brings many of the web's most useful services to your phone.

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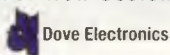


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Best browser-phones



PRICE \$1,795
ONLINE www.imate.com

i-mate JASJAR

This is the world's first smartphone to include a 640 x 480 display, running Windows Mobile 5.0 and slurping down web pages via 3G or Wi-Fi. It includes a full QWERTY keyboard, so web browsing is considerably better than the average smartphone. Don't expect to slip this into your pocket though: at 81mm x 128mm x 25mm, it's one chunky heiffer... (and at 285g is actually the same weight as a quality piece of restaurant steak).

PRICE \$TBA
ONLINE www.nokia.com.au

Nokia E61

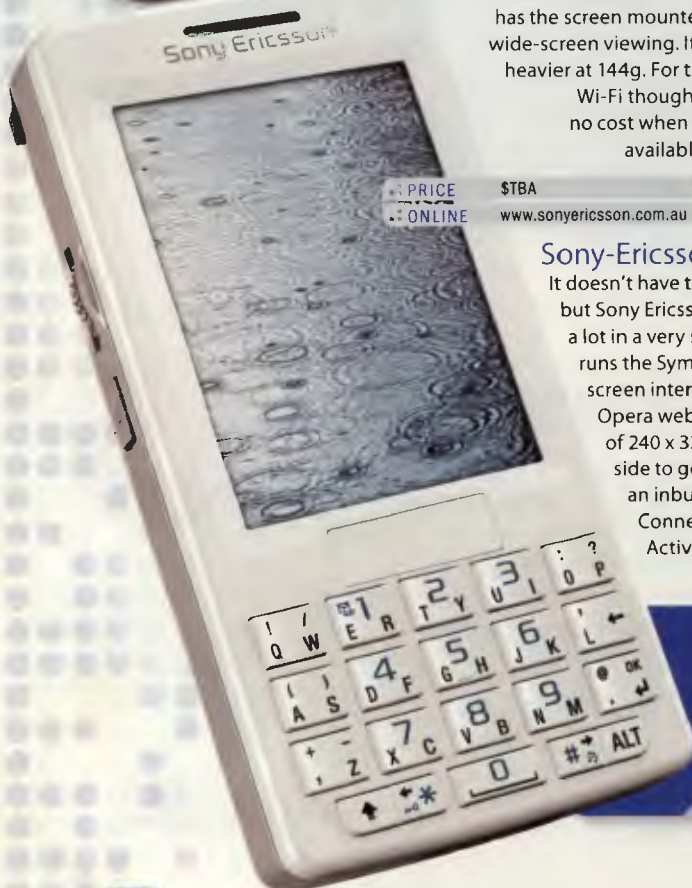
The Nokia E61 shares many of the M600i's features, but includes a QWERTY keyboard, and has the screen mounted horizontally for full-time wide-screen viewing. It's thinner (only 14mm), but heavier at 144g. For the extra weight you also get Wi-Fi though, so you can access the net at no cost when at home or work. It should be available within the next few months.



PRICE \$TBA
ONLINE www.sonyericsson.com.au

Sony-Ericsson M600i

It doesn't have the VGA resolution of the JASJAR, but Sony Ericsson's new 3G smartphone offers a lot in a very slim, light package. For a start, it runs the Symbian 9.1 OS with the UIQ 3.1 touch-screen interface. It includes the full-blown Opera web browser and a screen resolution of 240 x 320. You can turn the phone on its side to get wide-screen viewing. It also has an inbuilt RSS feed reader and supports Blackberry Connect for push email as well as Microsoft ActiveSync. It's only 15mm thick and weighs 112g.



>>> Sharp demonstrated a VGA-resolution mobile phone at the 3GSM World Congress conference in Barcelona in February. The Sharp 904 is based on a 480 x 640 pixel 2.4in Toshiba display — yes, the pixels are really, really tiny. No word yet on Australian availability.

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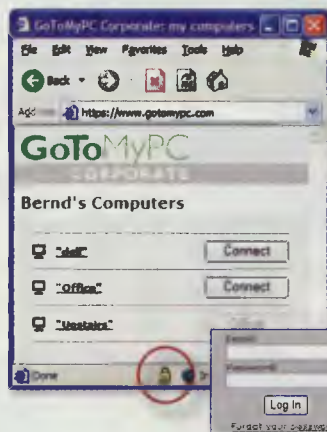


Control your PC from your mobile or PDA

Twenty-seven dollars (US\$19.95) a month might sound like a lot for the convenience of being able to access your PC remotely, but once you've tried Citrix's GoToMyPC service (www.gotomypc.com), it's addictive.

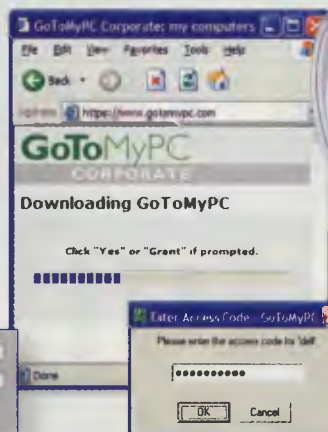
The service includes a viewer for mobile phones based on the Windows Mobile OS. APC tried it on an i-mate JASJAR (depending on how you look at it, a chunky 3G phone with a huge screen and keyboard, or a 3G "micro laptop" based on Windows Mobile) and it worked well.

Of course, the latency on 3G means that even though the link speed is up to 384Kbit/s, screen refresh is a bit sluggish because screen sharing involves a lot of back-and-forth data. Of course, Citrix doesn't transmit screen dumps of what's happening on your PC — it only updates parts of the screen that are changing, and so on.



Securely log in to www.gotomypc.com over SSL and select one of your desktops.

The GoToMyPC service is particularly impressive because it bypasses restrictive corporate firewalls. It worked through a heavily locked-down corporate proxy (and we tested it without playing around with any manual



A small viewer is downloaded on-demand and prompts for the locally stored access code.

configuration). It achieves this by making connections through regular outgoing TCP ports that are left open for web browsing (ports 80 and 443) and encapsulates all traffic inside standard HTTP wrappers. GoToMyPC runs as a



Access and control your desktop remotely — from anywhere and any device.

Java application on your machine, and there are two levels of password security before you can log in — once at Citrix's web site and then once on the shared screen of the PC. And of course, if you've left your PC locked, you then have to enter a correct Windows username and password to gain access.

Of course, you can also control your PC using the open-standard VNC screen sharing protocol and installing a mobile VNC viewer on your PDA or mobile (such as PocketVNC). However, it lacks the smooth edges of Citrix's service, like strong security and the ability to pass through corporate proxies hassle-free. **BTIC**

Best deals for 3G internet on your mobile

Yep, the mobile networks are ripping you a new one when it comes to phone-based web browsing.

A glance at APC's comparison table below shows that, without a doubt, mobile networks are profiteering on people who use their phone occasionally to browse the net. The situation improves if you are a heavier user — for example,

someone who frequently sends and receives email on a smartphone.

For example, Vodafone charges \$19.95 for 5MB of usage, but for two-and-half times the price (\$49.95), you get 60 times as much data (300MB).

The exception is 3, which has a good plan for light users: its Mobile Broadband Cap offers 5MB of usage

for \$5 a month, with a \$29 cap (which provides another 100MB of usage — at the \$1 per megabyte usage rate, though, you'll hit the \$29 cap after using only 29MB). The caveat, as always, with 3 is that if you roam onto the fallback Telstra GPRS network you'll get slugged \$1.65 per megabyte — and it's not included in any cap or your monthly included megabytes.

	VODAFONE					OPTUS		TELSTRA 3G				3			
Plan name	Data 0.5	Data 2	Data 5	Data 300	Data Unlimited (1GB)	Zoo Pay as you Go	Zoo Monthly Subscription	Pay as you go	\$5 pack	\$10 pack	\$15 pack	Pay as you use	Mobile Broadband Cap*	Mobile Broadband \$29*	Mobile Broadband \$69*
Price per mth	\$2.95	\$9.95	\$19.95	\$49.95	\$99.95	\$0	\$4.95	\$0	\$5	\$10	\$15	\$0	\$5	\$29	\$69
Included MB	0.5MB	2MB	5MB	300MB	1000MB	Nil	4MB	Nil	1MB	3MB	6MB	Nil	5MB	100MB	300MB
Usage cap	N/A	N/A	N/A	N/A	N/A	Usage charged at 1.5c/KB up to \$9.90	N/A	N/A	N/A	N/A	N/A	N/A	\$29	N/A	N/A
Cap MB	N/A	N/A	N/A	N/A	N/A	2MB	N/A	N/A	N/A	N/A	N/A	N/A	100MB	N/A	N/A
Overuse rate per MB	\$2/MB	\$2/MB	\$2/MB	\$2/MB	\$2/MB	\$3/MB	\$3/MB	\$15/MB	\$5/MB	\$3/MB	\$2.50/MB	\$4/MB	\$1/MB	\$0.30/MB	\$0.30/MB

* Internet usage only available on business handsets like the Motorola A1000.

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VoIP for SMEs

Just as a good web site can make a small operation look bigger, VoIP brings small businesses the rich feature set and flexibility of a PABX for no more — and maybe for less — than they would pay for a key system. *Stephen Withers* investigates the offerings of the leading suppliers.

six
PROVIDERS
COMPARED

RATED CRITERIA:

Features
Cost

The Linksys Voice System comprises of a variety of products and is intended for SOHOs and very small businesses, handling a maximum of 16 seats. Its local debut was expected shortly after this article was written.

Priced at \$619 for four seats (the 16-seat licence upgrade costs \$489.95), the SPA9000 IP Telephony System provides big-system features including a virtual receptionist, call

direction to multiple phones either simultaneously (first to pick up gets the call) or on a round-robin basis, forwarding, parking/pickup and more. Although the SPA9000 does not provide voicemail, it does integrate with provider-based voicemail systems.

Regional director Graeme Reardon says the SPA9000 supports up to four concurrent providers and the company is working with various Australian providers including engin.

The company makes a range of IP phones, but in Australia it's selling the \$269.95 SPA941, which it describes as a full-featured business class phone.

By adding a \$179.95 SPA3000 ATA, conventional phone lines can be used to retain an existing phone number for a fax machine, or for automatic failover for outbound calls if the VoIP provider is unavailable for some reason.

A wizard is provided to set up the device for individual VoIP providers and dial plans can be created to use the cheapest provider for specific call destinations such as Australian fixed lines, Australian mobiles, a frequently dialled country and a default for all other countries.

AVAYA

The Avaya IP Office provides small businesses with PABX functionality at the price of a key system (along with much greater scalability), says Gavin Milton-White, Avaya Australia's regional channel manager for SMBs South Pacific. Up to 360 users can be supported by the system, although it's being targeted at organisations with 15 to 100 users.

In addition to features such as automated attendant, voicemail, voice recording and support for multiple sites, Avaya's product includes software to allow the control of phone functions, such as transferring calls or setting up conference calls from a PC, minimising the training required. Furthermore, the system is designed to be administered by the owner, reducing the total cost of ownership by eliminating the need for routine visits by technicians. "You don't need to get your provider out every time you need to make a change," Milton-White says.

Support for multiple sites helps improve service levels. In a retail environment, for example, unanswered calls to a showroom can be picked up at head office. Milton-White says users report that improved service leads to better customer retention and hence greater profits.

IP Office users can be found in a diverse range of market segments, he says, including manufacturing, warehouse, distribution, wholesale, retail and law firms: "any small business that has a customer-facing department or a call centre."

A CTI interface supports various functions including automatic dialling from Outlook or generating a "screen pop" to display information about the caller based on caller ID or an account number entered via the automated attendant.

TAPI support means the IP Office can usually interface with the systems and software already in use, making the implementation more affordable. This "is a strong benefit," says Milton-White, as some other vendors charge expensive licence fees for the integration software (or they don't provide such broad compatibility).



IP Office comes with a proprietary software suite including Microsoft CRM integration, Phone Manager (for call and phone control from a PC), voicemail with auto attendant, and call recording with library functionality. "Our simple customer care software, called Compact Business Centre, in most situations provides desktop functionality that exceeds the standard offering associated with third party applications," adds Milton-White. "We enable businesses to do more with less."

IP Office is also available in a small business edition, which comes preconfigured for any one of four scenarios (eg. PSTN lines and analogue handsets, or ISDN lines and digital handsets) to allow use straight out of the box.

The system can also be used with VoIP providers such as engin, with automatic failover to PSTN or ISDN lines.

Off-site users such as home workers can run a softphone on their PCs and get full functionality, says Milton-White. "It's as if they're in the office." If they prefer a normal handset, an IP phone can be installed instead.

Restaurant delivery service Moving Menus has installed an IP Office linking its Melbourne and Sydney operations. "By making a move to IP telephony we have at once slashed costs and increased efficiency through the added functionality IP Office provides," says managing director Michael Campbell. "It's been like taking a magic wand to our most important business problems — they've just gone away!"

Eliminating STD charges between the two locations reduced inbound call costs by over 80 per cent, and further benefits have arisen from the features provided

The full feature set is important to SMEs, says Warhurst, and buyers look for features such as auto attendant, support for a "business within the business" (eg. calls to certain numbers must be routed and answered in a particular way) and presence (eg. to see the status of people working at home, or to route calls according to the user's status).

Real estate agencies in the US and Europe are putting the auto attendant to an interesting use: callers are given the opportunity to enter the code number they've seen in an advertisement, and a text-to-speech application reads the description from the agency's web site. Callers are then invited to "press 1" to speak to the agent handling the property.

The company's 30-user Media Exchange MX30, which is small enough to be wall-mounted, is

BY MAKING A MOVE TO IP TELEPHONY WE HAVE SLASHED COSTS AND INCREASED EFFICIENCY

by IP Office. For example, call-monitoring and reporting also allows management to monitor efficiency and redesign work practices accordingly.

ZULTYS

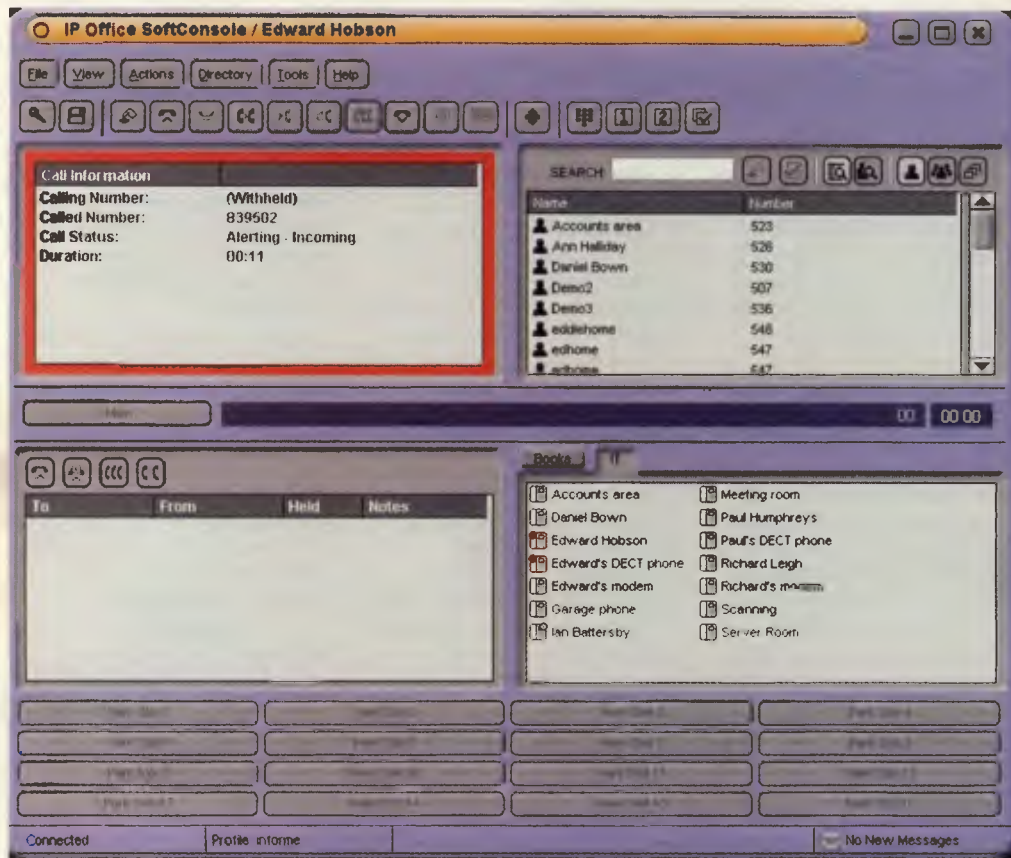
"We built products to target true SME customers outside the US," says Tony Warhurst, director of Oceania business development at Zultys Technologies — few Australian businesses fall outside US definitions of SME. Zultys sees its products as "the ultimate business leveller" — the same features and functionality are available whether a customer has two or 10,000 users.

selling well here, he says.

The Media Exchange software includes TAPI support to work with other compliant devices and software including Outlook (eg. to automate dialling) and ACT! (eg. to generate "screen pops" displaying information about the caller).

Ease of deployment is an important issue for this market, which is used to self-installing ADSL connections, for example. Warhurst claims installation can be completed in less than an hour. While Zultys' channel strategy is to use resellers rather than retailers, the company offers a range of bundles that could be sold in shops, he says.

VENDOR	ONLINE	PHONE
1. Avaya	www.avaya.com.au	1800 302 833
2. CPS	www.cpstg.com	(03) 9835 1650
3. IPL	www.ipl.com.au	(02) 9667 7000
4. Linksys	www.linksys.com.au	1800 678 808
5. Siemens	www.siemens.com	13 72 22
6. Zultys	www.zultys.com/index.jsp?site=AU	(02) 8912 7800



Avaya IP Office's users can be found in a diverse range of market segments.

gateway, firewall and a small network switch. The rack-mounted device installs by plugging in to the mains and running cables to the ADSL connection and LAN switch (if present). Configuration is performed via a web browser, a task that Anderson says is as easy as setting up a home router. IP PABX appliances are more popular among SMEs than server-based systems, he adds.

All the popular PABX features including call pickup and transfer, call groups, voicemail and speed dial are supported. A utility allows numbers to be associated with particular phones, and Siemens' wizards are being progressively improved to simplify the whole setup process.

According to Anderson, most customers use the HiPath with ISDN connections, but some are using SIP carriers and the company can preconfigure the device to work with particular providers. Some customers prefer to keep their existing lines for incoming calls while routing outgoing calls via VoIP. If necessary, the device can support multiple SIP providers.

While it can also be used with PSTN lines, the target market generally has existing ISDN connections, he says.

Integration with desktop applications is provided via Siemens' HiPath CAP software, which includes TAPI, JTAPI and CSTA III (Computer Supported Telecommunications Applications) interfaces. CSTA is an ECMA standard for monitoring and controlling calls and devices that simplifies integration. As Anderson says, "It's so much easier to do."

HiPath 2000 systems, due for release in April 2006, start at around \$3,000, excluding handsets.

CPS

The key features sought by SMEs are voicemail, call forwarding, auto attendant, call recording, and connectivity to home or remote offices and partners' premises, according to Andrei Papay, solution architect and co-owner of CPS Technology Group.

Generally, the concern is to improve service — cost savings (eg. through toll bypass) simply

A BASE PRICE FOR THE HARDWARE MEANS YOU DON'T PAY FOR MORE FUNCTIONALITY THAN YOU NEED

All Zultys phones have two or four Ethernet ports, so no network changes are needed as long as the site already has a 100MB switched LAN. All that's needed at the desktop is to unplug the Ethernet cable and plug it into the phone, and then run a second cable from the phone to the PC. The switches built into the phones run at full-line speed, so there is very little effect on data traffic — some competing products use software switching, Warhurst warns, which can have an adverse effect on performance.

User-accessible software can "bind" a number to any phone on the network, so an extension in the Sydney office can reach the same person wherever in the world they happen to be working.

Customers are trialling various VoIP providers such as Engin and

vCall. Larger organisations can link multiple MX30 and MX250 devices into a single virtual PABX. Benefits include centralised management, extension number dialling to remote sites and ensuring that local calls are made locally.

"When we first looked at VoIP we thought the value was in the low-cost calls, but the Zultys system showed us that real value could be generated from gains in productivity," says Ben Johnston, a partner at Addisons Lawyers in Sydney.

"Our final decision was based on criteria such as ease of use and the cost benefits. Zultys provided us with a telephone system that not only met our needs but also, and importantly, equipped us to meet the changing demands of our clients," he said.

Zultys charges a base price for the hardware — allowing it to compete with key systems even on six-seat installations, says Warhurst — and then lets buyers switch on additional features as needed on payment of the corresponding licence fee. This means you don't pay for more functionality than you need and lets you upgrade without the disruption of changing the hardware.

An MX30 with ten handsets and all features enabled costs \$7,400 (or \$13,000 with 20 handsets).

SIEMENS

Mark Anderson, product marketer at Siemens Communications, claims his company's HiPath 2000 is "a complete voice solution" for SMEs, combining PABX functionality for up to 64 phones with an internet

ADSL2/2+

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 - SPI firewall
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 - 4-port Layer 3 QoS Router
 - SPI firewall
 - 2x FXS ports for VoIP equipment
 - 1x FXO port for PSTN backup

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 - Single port Ethernet/Single USB port
 - SPI firewall



RRP: \$129.00

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Ideal for users who need to connect & network multiple wired devices and share an Internet service
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 - 4-port Ethernet switch/Single USB port
 - SPI firewall



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This model is ideal to network and share an Internet service for both wired and wireless users
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 - Built-in router with IP QoS making it ideal for VoIP
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 - SPI firewall



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help the ROI. This often requires linking to customer management systems and other applications, and Papay says this is easier with the systems CPS supplies than with larger proprietary systems.

"The handsets are the expensive part," he says, but it is possible to add Vertical's TeleVantage IP PABX to an existing installation — even if it is just a key system — to get the advantages of a modern system without wholesale replacement. For example, incoming calls can be handled by the auto attendant, which can direct the call to the appropriate extension using whatever means are supported by the particular key system.

Interestingly, Papay notes that smaller customers do tend towards replacement, while it's the larger companies that often use TeleVantage to extend existing systems.

Smaller organisations can take advantage of VoIP providers such as Engin with little or no retraining, he says.

Benefits include the simplicity of a web interface for tasks such as changing their voicemail message instead of using awkward key codes on the handset. Outlook integration also means presence information is reflected in the phone system. For example, when someone is away from their desk, calls can be automatically diverted

to their mobile.

Other software can be easily and affordably integrated with TeleVantage. While the top three categories are CRM, IVR and job dispatch, customers are using it for specialised purposes such as automatically phoning parents when their child is unexpectedly absent from school, or to inform newsgagents of the expected delivery time for their newspaper order.

TeleVantage brings IVR into SME's price range, explains Papay. Increasing support from (and integration with) third-party applications means

off-the-shelf solutions are available for less than \$1,000. "It does give a lot of choice to organisations," he says. One advantage of a server-based system over an appliance is that it makes it easier to add features such as call recording.

On the Move, a Melbourne-based company that assists people and companies relocating within Australia by coordinating various service providers, is a TeleVantage user.

"Our call recording system is an invaluable tool in our communication process and it has increased our customer service

level several notches," says commercial director Paul Bullen. "Custom screen pops, call tracking and the ability to point and click to place calls has increased productivity levels and improved customer service."

TeleVantage itself costs \$995 for a starter pack handling four outside lines and eight extensions. Server requirements are minimal: 400MHz Pentium II and 256MB of RAM, with Windows 2000/2003 Server (or 2000/XP Professional for a maximum of ten simultaneous connections). It is typically used with a PCI ISDN card to handle between four and 120 phone lines.



Linksys' SPA9000 provides big-system features including a virtual receptionist, call direction, call forwarding, parking/pickup and more.

More features or lower costs?

The value of cheap or free calls shouldn't be overlooked, especially when the business operates at multiple sites or has mobile or home-based workers.

But some vendors say this is becoming less of a concern. "Businesses are realising the value of additional applications [and integration]," says Gavin Milton-White, SMB regional channel manager at Avaya. "It's not a price differentiator like it used to be."

Tony Warhurst, Zultys Technologies' director of business development, Oceania, agrees: "It's not all about toll bypass." Rather, buyers are looking for functionality and making it easier for people to reach you.

NetComm takes an opposite view. According to managing director David Stewart, large companies are buying systems from vendors such as Avaya, Cisco and Nortel, largely to save on call costs between their various sites. Mid-range businesses aren't about to replace their existing PABXs, but NetComm is seeing "significant" demand for its devices that convert four or eight outside lines to VoIP. "It's very inexpensive," says Stewart, and only takes an hour to install and set up. Importantly, there's no need to retain staff. That said, NetComm has been developing an IP PABX and expects to go into production before the middle of the year.

Stewart sees little demand for integration between desktop

applications and the phone system. Only call centres are looking for integration at the moment, and most people just want memory dialling and cheap outbound calls. NetComm's sales leads generally refer to cost saving: "there's not much other interest [among businesses and individuals]," says Stewart.

But it needn't be an either/or question. IPL director Dean Joscelyne thinks it's about cost saving and features. "VoIP is toll bypass for the masses," he says, and there are also cost benefits accruing from a single infrastructure for voice and data, call routing to remote workers and easy adds/moves/changes.

One of the bugbears of traditional PABXs is that any changes, such as

altering the extension number associated with a particular line, generally require a visit from a technician. This makes for high running costs, especially in today's dynamic environment.

Engin CEO Ilkka Tales says a customer survey shows 90 per cent of SMEs are looking for cost savings and only three per cent are primarily concerned with extra features. That said, the features sought by SMEs include support for multiple premises (including home offices), auto attendant, IVR and music on hold. They also want expandable systems at a low upfront price and, in Tales' words, "the appearance from a customer perspective of being a large organisation at a low cost."



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IPL

IPL is a value-added distributor of Avaya and Alcatel products and a reseller of Optus carriage products. The company has installed an Avaya IP Office at its own premises.

IPL director, Dean Joscelyne, says SMEs are more concerned with cashflow than return on investment, and "there are over 1.5 million small businesses that have a very simple requirement" involving three or four lines: one or two for voice, one for fax, plus one for the EFTPOS terminal (and possibly broadband internet). The company is developing The Kaboodle, a one-box implementation of this setup that will sell for a few hundred dollars — excluding handsets.

Moving slightly upmarket, VoIP systems can provide applications such as unified messaging (eg. voicemail and faxes delivered to the Outlook inbox), speech recognition and synthesis (eg. to read emails over the phone) and screen pops from

CRM and similar applications (to deliver information about the customer to the person taking the call).

Outlook is the key messaging application in the SME market, says Joscelyne, though CRM integration is also important.

The company is currently supplying around 150 IP PBXs per month. The vast majority go into single premises, but between six and 12 are installed at multi-site organisations — typically a head office plus between one and four branches (and replacing a traditional PBX at head office and key systems at the branches).

"Out of the box" installation isn't a reality, he suggests, as different companies have

Larger organisations can link up multiple Zultys MX30s to create a single virtual PBX.

different procedures, so what works well for one won't necessarily work elsewhere.

Alcatel buyers are typically companies that have outgrown a couple of regular phones, but want more functionality than a key system can provide without having to pay a premium. A small Alcatel system

with around half a dozen handsets costs less than \$2,000, says Joscelyne. "The handsets are the expensive components," (especially if you want colour screens), he warns.

An Avaya IP Office with four ISDN basic rate ports and four relatively simple handsets costs around \$4,600. [BTE](#)



Hosted services

Although we've focused on products that businesses can purchase and install, IP PBX functionality is also available as a hosted service.

AAPT's IProvide service is initially being positioned as a PSTN service with "toll quality" at lower prices (and bundled with internet and VPN access), but the platform is able to deliver various PBX-style features, says IProvide managing director Phil Sykes.

Services such as hunt groups and call forwarding/redirection are already included, along with Outlook integration.

M-commerce developer Utiba is an early adopter of IProvide. "We have chosen IProvide Office for our fixed voice communications in our Melbourne office. The solution delivers the equivalent of our old Telstra lines but enables us to have more phone extensions without buying a small PBX or key system," says CEO Richard Matotek. "We believe we will save approximately 40 per cent compared to our previous traditional phone services due to the cheaper line rentals and lower call

costs. We are now investigating putting the IProvide Office-managed routers in the homes of our key staff and our remote offices in Singapore and the Philippines so that we can take advantage of the free inter-office calls that are available with the service".

IProvide CTO Greg Tilton suggests call recording, IVR and other features will be offered later once the company has decided how to market them. The current plan is to introduce IVR in the third quarter and to provide self-service provisioning so customers can activate features on demand.

The hardware installed at the customer's site — an IP router and ATAs for up to 20 lines — is remotely managed by the company.

Prices start at \$25 per line for four to six lines, including unlimited internet access. Calls are charged at AAPT direct rates, with the exception of those to the customer's other premises in the same state (which are free). "Key systems are the last vestige of the way the world used to be," Sykes says.

Linksys is having an each-way bet. In addition to the products it sells for installation at customers' premises, the Linksys One Hosted Small Business System is aimed at organisations with between 10 and 100 seats, with a sweet spot around 50, says Linksys regional director Graeme Reardon.

Hosted SBS combines business-quality voice, video, data networking, business applications and high-speed internet access through a single connection. IP Systems is expected to operate the system in Australia, with a rollout beginning in the second quarter.

"Small businesses are looking for complete communications solutions (that are simple to install and manage) with sophisticated service offerings that reflect their business model, budget, and internal expertise. Hosted SBS such as Linksys One are the answer," says Charles Giancarlo, Cisco chief development officer and Cisco-Linksys president.

The managed VoIP service offered by ValueNet provides features

including voicemail (with email notification or delivery), teleconferencing, auto attendant with up to four recorded messages, direct dial number for each user, call screening and forwarding, hunt groups and find me/follow me. Outlook synchronisation is also supported.

Lifting, rigging and specialist safety equipment supplier Bullivants chose ValueNet's service as it reduces upfront costs, avoids delays (when a new employee is appointed or an existing staff member moves to a different workspace) and aids productivity by helping to direct calls to the right person the first time.

"Fundamentally, the hosted VoIP solution has delivered the same quality of service in our telephone communications but the tangible value is that Bullivants has achieved a most appealing ROI in a number of areas including capex [capital expenditure] and operational savings as well as flexibility and scalability with our current and future telephony needs," says chief financial officer Victor Davies.

AVAYA



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home desktops



Plus Corporation Altera FX-60 Ultra 2

CONTACT Plus Corporation
ONLINE www.pluscorp.com.au

PHONE 1800 007 587
PRICE \$6,250



A real tour de force, centred around an AMD Athlon FX-60 dual-core CPU seated in an ASUS A8N32-SLI motherboard. Comes with an MSI GeForce 7800 GTX 256MB card, 2GB of RAM and two 500GB hard drives. It won the most benchmark tests in our recent Megatest (April).

best overall

TI AMD Dual 3800 Deluxe

CONTACT TI Computers
ONLINE www.ticomputers.com.au

PHONE (02) 9437 5437
PRICE \$1,499



Packs a dual-core AMD 3800+ CPU, a gig of RAM and a 250GB hard drive. In APC's April PC Megatest, it trounced all other similarly priced machines in performance benchmarks. Enough grunt for net browsing, office productivity (and games on weekends). Includes CRT monitor.

best value

BEST BUYS

Cut through the hype — APC's independent reviewers point to the best technologies in the top-selling product categories each month.

The **Best Overall** award is for products we believe are the best, regardless of price.

The **Best Value** award is for those which offer a good combination of features for a reasonable price.

APC reviewers contributing to the APC Best Buys guide: John Gillooly, Nick Race, Dan Chiappini, Matt Overington, Stephen Withers, Adam Turner and Anthony Caruana.

business desktops

Lenovo ThinkCentre M52

CONTACT Lenovo Australia
ONLINE www.lenovo.com/au/en

PHONE 1300 557 073
PRICE \$1,300



A state-of-the-art business PC with a host of system management and rescue and recovery utilities, an embedded security chip and integrated Gigabit Ethernet. Small form factor, a Pentium D 930 CPU, 1GB RAM and a 160GB hard disk. Price does not include monitor.

best overall

Optima WorkPro 7000T

CONTACT Optima
ONLINE www.optima.com.au

PHONE (02) 9701 3777
PRICE \$1,399



Optima is a big supplier to government, schools and business. The 7000T features an AMD Athlon 64 3200+ in Socket 939, so it's upgradeable later on and the chassis is interchangeable with previous Optimas. Well within reach of small businesses at this price.

best value

smb servers



HP ProLiant DL380G4 SAS

CONTACT HP
ONLINE www.hp.com.au

PHONE 1 300 305 017
PRICE From \$6,140

Powered by two Xeon processors up to 3.5GHz, room for six sticks of 12GB of DDR2 and eight hot-plug SAS hard disk drives. Plenty of punch for only two rack units of space (even floppy and optical drives).

HP's System's Insight Manager will keep it running and stable.



best overall

SUN Fire X2100 Server

CONTACT Sun
ONLINE www.sun.com.au

PHONE 1800 628 193
PRICE From \$992



A fully kitted out X2100 system with an Opteron Model 180 dual-core processor, 2GB of unbuffered ECC DDR400, an 80GB SATA drive and Solaris 10 pre-installed. Comes with a low entry price, but the system is eminently upgradeable and undoubtedly powerful.

best value

motherboards / cpu

ASUS A8n32-SLI Deluxe

CONTACT ASUS
ONLINE www.asus.com.au
PHONE 1300 278 788
PRICE \$340



For power users, this is still the cream of the crop. With AMD's new AM2 socket only a few months away, this board marks the pinnacle of Socket 939 hardware. A huge feature set plus support for Athlon 64 chips and dual 16x SLI lanes — this board delivers on all fronts.

best overall

Gigabyte GA-K8N-SLI

CONTACT Synnex
ONLINE www.synnex.com.au
PHONE 1300 100 100
PRICE \$199



The GA-K8N-SLI brings Nvidia's dual-graphics chipset to a reasonably priced motherboard. Enough functionality for a high-performing Athlon 64-based PC and the SLI slots only just lack the bandwidth for ultra high-end cards. You'll need a floppy drive to install Windows.

best value

video cards

ATI Radeon X1900 XTX

CONTACT ATI
ONLINE www.ati.com
PHONE N/A
PRICE Approx \$950



Current performance king and pinnacle of ATI's product line, the X1900 XTX delivers. No faster than a normal X1900 XT when used in dual-card CrossFire setups, but hands down the fastest single card on the market today with all the latest features, eg. Shader Model 3.0 support.

best overall

NVIDIA GeForce 7600 GT

CONTACT Nvidia
ONLINE www.nvidia.com
PHONE N/A
PRICE Approx \$375



Nvidia's recently released mainstream card, the GeForce 7600 GT raises the bar for price/performance. With significant performance boosts over the last-generation 6600 GT card, the 7600 GT also comes with support for SLI, allowing performance to spiral even higher.

best value

monitors

Dell 2405FPW

CONTACT Dell
ONLINE www.dell.com.au
PHONE 1800 812 393
PRICE \$1,699



APC's labs team is still in love with Dell's 24in, 16ms screen. With a HD ready 1,920 x 1,200 native resolution, this screen is the perfect size for staring at, just filling one's field of view. Heaps of inputs, a great OSD and no ghosting. The finest possible way to view your PC.

best overall

BenQ FP71G

CONTACT BenQ
ONLINE www.benq.com.au
PHONE (02) 9352 8800
PRICE \$350



Proof that good things can come in small packages, this 17in LCD screen manages to stay at a low price point while still delivering 8ms response time and D-Sub and DVI inputs. Basically packs in everything you need for painless computer usage at a reasonable price.

best value

optical drives

Sony DRU810A

CONTACT Sony
ONLINE www.sony.com.au
PHONE 1300 138 246
PRICE \$119

Sony has led the pack in developing top-notch optical drives for years now. Here, double-layer support, a solid software suite and impressive write speeds (16x for DVD+R discs, 8x for DL discs and 48x for CD) round out the feature set. Better yet, it's backed up by a one-year warranty.

best overall

Pioneer DVR-A10XL

CONTACT Pioneer Electronics
ONLINE www.pioneeraus.com.au
PHONE 1800 666 383
PRICE \$99

With DVD-writer prices tumbling all the time, it's hard to go past a drive capable of burning double-layer discs for less than \$100. It's perfect for a home theatre or media box and is available with black, beige or silver front panels. The Nero software suite is even thrown in for good measure.

best value



internal hard disks



Seagate Barracuda 7200.9 500GB

CONTACT Ingram Micro
ONLINE www.ingrammicro.com.au

PHONE 1300 653 333
PRICE \$619



The king of the storage heap with 16MB of cache, full SATA 2.5 spec support, staggered-drive spin-up, hot-plug and hot-swap, NCQ and an incredibly roomy 500GB capacity. It's not the fastest on the block but no slacker either, with an average transfer speed of 52.3MB/s.

best overall

Western Digital WD2500JS 250GB

CONTACT Western Digital
ONLINE www.westan.com.au

PHONE (03) 9541 8888
PRICE \$169



Western Digital's drive delivers 250GB capacity, (the sweet spot in the market right now) but is more reasonably priced than the competition. It's got 8MB of cache, spins at 7,200RPM and has a 300MB/s SATA interface (not that any drive can saturate that at the moment).

best value

external hard disks



LaCie Rugged All-Terrain Hard Drive

CONTACT LaCie Australia
ONLINE www.lacie.com/au

PHONE (02) 9669 6900
PRICE \$399 (80GB)



If you need to move data from A to B, LaCie's drive is a good bet. The small, rubber-coated orange box sports USB 2.0, FireWire and FireWire 800, and reaches capacities of 120GB. A tad pricey, but zippy performance and the connection interfaces make it a great choice.

best overall

Western Digital Passport Portable HD

CONTACT Western Digital
ONLINE www.westan.com.au

PHONE (03) 9541 8888
PRICE \$269 (80GB)



For those with more modest requirements, it's hard to go past the Passport line. Slim, compact and quick, it works via host power, so you don't generally need to lug a power adaptor. It doesn't ship with a case or software, but if you're just after a mobile repository, who cares?

best value

media / nas servers



Buffalo TeraStation Home Server 1.0TB

CONTACT Uniden
ONLINE www.uniden.com.au

PHONE (02) 9599 3355
PRICE \$1,799



If you're going to keep your media library online, you want lots of storage. The TeraStation provides a nominal terabyte (less if configured as RAID 1 or 5), Gigabit Ethernet, support for DNLA media players, four USB ports and an FTP server for remote access.

best overall

Maxtor Shared Storage Plus

CONTACT Maxtor
ONLINE www.maxtor.com.au

PHONE (02) 9369 3662
PRICE \$399 (200GB)



Maxtor's Shared Storage Plus provides 200GB to 500GB of network storage, with the ability to stream media files to UPnP AV media adaptors without the intervention of a PC. USB ports allow connection of printers and external disk drives for additional storage.

best value

portable / usb

Sandisk Cruzer Micro

CONTACT Sandisk
ONLINE www.sandisk.com

PHONE 1800 793 652
PRICE \$72.89 (512MB)



USB memory keys are a part of modern computing. Be it transporting files, storing information or sharing photos, the humble USB key put the final nail in the floppy disk coffin. The Micro offers high transfer speeds in a tiny form factor (with a handy lanyard).

best overall

Corsair Flash Voyager

CONTACT Altech
ONLINE www.altech.com.au

PHONE (02) 8831 9999
PRICE \$55 (256MB)



Corsair's Flash Voyager is a compelling choice if you care more about storage capacity than diminutive size. It offers a USB 2.0 connection and ships with a 10-year warranty, which should prove ample for anyone looking to move files around between now and say, 2016?

best value

notebooks multimedia

Toshiba QOSMIO G30

CONTACT	Toshiba ISD	PHONE	13 30 70
ONLINE	www.isd.toshiba.com.au	PRICE	\$4,299



When it comes to entertainment on the go, Toshiba has it all sewn up. The flagship model packs a beastly 2.0GHz dual-core CPU, 200GB hard disk, 1GB RAM and an integrated high-def and analogue TV tuner to take advantage of the 17in wide-screen. A powerhouse.

best overall

notebooks business

Lenovo ThinkPad R52

CONTACT	Lenovo	PHONE	1300 557 073
ONLINE	www.lenovo.com/au	PRICE	From \$1,850



Serious road warriors need look no further. Built to outlast even the most demanding treatment, the R52 is also packed with smart tech to save your business, including biometric fingerprint scanner, power-on and disk passwords (to keep that sensitive data safe).

best overall

Dell Inspiron 9400

CONTACT	Dell	PHONE	1800 812 393
ONLINE	www.dell.com.au	PRICE	From \$3,500



Dell has a great reputation for offering affordable PCs without skimping on the tech inside. The 9400 is about as good as it gets and gives you mobile performance and gaming (GeForce 7800). Couple this with 1,920 x 1,200 display res and a high-definition TV tuner. Nice.

best value

Dell Inspiron 1300

CONTACT	Dell	PHONE	1800 812 393
ONLINE	www.dell.com.au	PRICE	From \$998



Whatever the size and nature of your business fleet, it's tough to go past Dell. While the business units don't have over-the-top specs, they're amply configured to deal with day-to-day work usage (and the bargain prices will only help sweeten the decision).

best value

notebooks ultraportable

Toshiba Libretto

CONTACT	Toshiba	PHONE	13 30 70
ONLINE	www.isd.toshiba.com.au	PRICE	From \$3,499



Look closely when shopping for a notebook or you might miss this one. At just 7.2in, the display is tiny (and the keyboard matches). Don't be fooled by the chassis though, there's plenty of grunt inside (and you can throw it into your backpack with room to spare).

best overall

Sony VGNTX27GPT

CONTACT	Sony	PHONE	1300 138 246
ONLINE	www.sony.com.au	PRICE	\$3,699



The bigger brother of the TX1700, we were blown away by its crisp display, tiny form factor and battery life. Able to run over eight hours on a single charge (and with an optional extended battery, there's no need to worry if you forget your charger).

best value

handhelds / smartphones

O2 XDA Atom

CONTACT	BrightPoint	PHONE	1300 300 213
ONLINE	www.seeo2.com	PRICE	\$1,229



O2's XDA Atom is small but packs plenty of punch. With Bluetooth, Wi-Fi, IR, Tri-band GSM and GPRS (and a whole bunch of office productivity apps), the Atom smartphone proves that you can go a long way to being all things to all people.

best overall

HP iPaq hx4700

CONTACT	HP	PHONE	13 13 47
ONLINE	www.hp.com.au	PRICE	\$799



HP's hx4700 has been around since 2004 but it still has the best screen on any PDA we've ever seen. The recent update to Windows Mobile 5 gives it a lift and the powerful processor, dual memory slots, Wi-Fi and Bluetooth stack up against more recent devices. Easily best value.

best value



consumer printers

Canon Pixma iP6600D

CONTACT Canon
PHONE 1800 021 167
ONLINE www.canon.com.au
PRICE \$399



Not the speediest printer on the block, but excellent output quality. PictBridge and infra-red support make up for a lack of dedicated card slots, and built-in duplexing will save paper. Offers an (optimised) 9,600 x 2,400dpi; ships with both Mac and Windows software.

best overall

Lexmark Z735

CONTACT Lexmark
PHONE (02) 9930 3500
ONLINE www.lexmark.com.au
PRICE \$79



If you don't print often or need the bells and whistles of a high-end printer, this entry-level will suffice. No Mac or Linux support, but the single cartridge design is fine for low-volume users and students. 1,200dpi resolution is fine for text, but don't use it to print photos.

best value

smb printers

HP Officejet Pro K550

CONTACT HP
PHONE 1300 305 017
ONLINE www.hp.com.au
PRICE \$349



Total cost of ownership is the benchmark for business performance and the speedy K550 doesn't disappoint, with a USB interface and a 250-sheet tray, while four ink tanks minimise the time between cartridge changes. The 1,200dpi text output is remarkably quick and clear. An Ethernet port is provided on the K550dtn (for \$499).

best overall

Lexmark P915

CONTACT Lexmark
PHONE (02) 9930 3500
ONLINE www.lexmark.com.au
PRICE \$199



If the bottom line is all important and you've got modest requirements, Lexmark's P915 is an inexpensive printer offering reasonable output quality. The six-colour print engine also spits out acceptable photo prints, allowing it to serve a number of functions.

best value

multifunction consumer

Canon Pixma MP780

CONTACT Canon
PHONE 1800 021 167
ONLINE www.canon.com.au
PRICE \$549



Solid paper handling, quick scanning, PC and Mac support, and individual ink tanks complement outstanding print quality for a top-notch multifunction printer. It packs a PictBridge port and comes with standard fax support, but doesn't include an Ethernet port.

best overall

Brother MFC-5840CN

CONTACT Brother
PHONE (02) 9887 4344
ONLINE www.brother.com.au
PRICE \$429



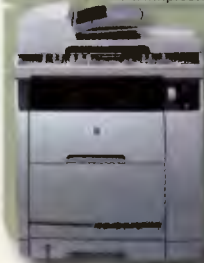
An automatic document feeder, dual-input paper trays, Ethernet support and media card slots help make the MFC-5840CN a winner for shoppers on a budget. Unfortunately, it's a bit slow and output isn't crystal clear (but excellent value nonetheless). Fax support is a boon.

best value

multifunction smb

HP Colour LaserJet 2840 All-in-One Printer

CONTACT HP
PHONE 1300 305 017
ONLINE www.hp.com.au
PRICE \$1,699



Launched in the middle of last year, HP's Colour LaserJet 2840 All-in-One is the proven star for small business, providing exceptional quality colour printing at a price that's affordable for the sector. The only downside is slow print speed; 4ppm colour/19ppm black.

best overall

Brother MFC-9420CN

CONTACT Brother
PHONE (02) 9887 4344
ONLINE www.brother.com.au
PRICE \$1,599



\$100 cheaper than the HP Colour LaserJet 2840, but in many ways the new Brother is a better MFC, with faster print speeds (8ppm colour/31ppm black), built-in management and security features and high-capacity replacement toners. Cost savings = best value.

best value

adsl modems

Billion 7402VGP

CONTACT PC Range
PHONE (08) 8322 9544
ONLINE www.billion.com.au
PRICE \$299

It's hard to beat Billion's 7402VGP on features and price. For your \$299, you get the fastest ADSL2+ modem in terms of actual throughput (over 1km and 2.5km phone line length), robust 802.11g wireless networking (supporting WPA2 security) and three Ethernet ports. There's inbuilt VoIP and PSTN passthrough (if the VoIP ever fails).



best overall

Thomson Speedtouch ST546

CONTACT Connexus
PHONE (02) 9452 6001
ONLINE www.dvdirect.com.au
PRICE \$129.95

At \$129.95, the Thomson Speedtouch ST546 is a solid and reasonably priced ADSL2+ modem/router. The Speedtouch features four 10/100 ports and particularly good controls for Quality of Service (QoS), which is an important consideration if you want to use VoIP. Plus, lifetime telephone support is amazing for the price.



best value

wireless routers

Apple Airport Express 802.11g

CONTACT Apple
PHONE 13 36 22
ONLINE www.apple.com.au
PRICE \$199

Apple's 802.11g wireless router is pricey, but includes analogue and digital audio outputs for iTunes wireless music streaming and a USB port for wireless printer sharing. The setup software lets you avoid complex config interfaces and its small size is ideal for travelling.



best overall

Gigabyte AirCruiser MIMO GN-BR03GM

CONTACT Rectron
PHONE (02) 9748 7720
ONLINE www.rectron.com.au
PRICE \$110

Until 802.11n arrives, we'll have to put up with 802.11g speeds that drop away quickly when you move away from the transmitter. But, this Gigabyte wireless router uses MIMO to bounce signals around obstacles and get to places other routers can't reach. See full review page 44.



best value

voip adaptors

NetComm V300

CONTACT NetComm
PHONE (02) 9424 2070
ONLINE www.netcomm.com.au
PRICE \$199.10

Low upstream speeds on most broadband connections mean Quality of Service (QoS) support makes a big difference to how you sound during a VoIP call. In APC's testing, the NetComm V300 delivered good voice quality — with minimum impact on data traffic.

It also lets you use one handset for both VoIP and PSTN calls.



best overall

NetComm V100

CONTACT NetComm
PHONE (02) 9424 2070
ONLINE www.netcomm.com.au
PRICE \$128.70

Connect the V100 to a power point, your network and a handset, and you're in business. Available as a generic model or preconfigured for certain VoIP providers. Some people prefer a box that allows more diddling around but, frankly, we're attracted to the simplicity.



best value

gps devices

TomTom Go500

CONTACT TomTom
PHONE N/A
ONLINE www.tomtom.com
PRICE \$1,099

Feature-rich and easy to use, the Go500 delivers a truckload of features that are so well put together you're scarcely aware of them all, plus, the Go500 acts as a wireless Bluetooth speakerphone for your mobile. Route calculation is fast and easy to use. Brilliant.



best overall

StreetPilot c320

CONTACT GME Electrophone
PHONE (02) 9844 6666
ONLINE www.gme.net.au
PRICE \$899

It just works — when you can say that about a complex piece of hardware you know you're on a winner. StreetPilot's c320 tells you how to get from A to B simply. It's not as feature-rich as other GPS receivers but what it does it does well. For GPS on a budget, this is it.



best value



digital cameras

Canon EOS-1Ds Mark II

CONTACT Canon
ONLINE www.canon.com.au

PHONE 13 13 83
PRICE \$12,999



When it comes to superb image-quality photography, it's hard to go past Canon. If Canon keeps bringing out models even half as good as the 1Ds, then 35mm has truly had its day. If you're looking to drop some serious cash for seriously good images, look no further.

best overall

Kodak EasyShare V550

CONTACT Kodak
ONLINE www.kodak.com.au

PHONE 1800 267 588
PRICE \$599



Compact, sexy and easy to use, this is the epitome of technology. Kodak has whacked a nice big 2.5in LCD on the back, while the 5MP and 3x optical zoom makes it anything but a slouch when you need a sharp, focused precious moment. Ease of use will help first-timers get up and snapping.

best value

video cameras

Sony HVR-A1P

CONTACT Sony
ONLINE www.sony.com.au

PHONE 1300 137 669
PRICE \$4,290



This is the pro-level version of Sony's CMOS-based HC1. It packs a lot of serious options without entering the usual stratosphere of pro-level prices. Here, you get 1080i HDV plus XLR inputs, time-code capabilities, 4-channel audio support, plus choice of video format. A classy little number.

best overall

Panasonic NV-GS300

CONTACT Panasonic
ONLINE www.panasonic.com.au

PHONE 13 26 00
PRICE \$1,539



This is a close-fought category, but the GS300 sets itself apart by delivering 3CCD at an amazing price. With optical stabilisation, 10x zoom and Leica lensing, this is a great little unit. No built-in effects, but who has ever used them and not regretted it later?

best value

projectors

BenQ PE7700

CONTACT BenQ
ONLINE www.benq.com.au

PHONE (02) 9352 8800
PRICE \$4,999



The PE7700 offers excellent picture clarity and tone, a wide-screen native resolution of 1,280 x 768 pixels and a 3,000-hour lamp life. Support for progressive scan mode, dual-composite and HDMI inputs and a backlit remote control make this BenQ unit hard to beat.

best overall

Toshiba S8 DLP

CONTACT Toshiba
ONLINE www.toshiba.com.au

PHONE (02) 9887 6000
PRICE \$1,999



If you're after a basic projector to handle some gaming, movies and web surfing, the S8 is a safe bet. 800 x 600 pixel resolution, 2,000:1 contrast ratio, and composite, S-Video and VGA inputs. Better still, the 10,000-hour lamp life means you won't have to buy pricey bulbs every few months.

best value

tv tuners

Pinnacle PCTV 310i

CONTACT Lako Pacific
ONLINE www.lakopacific.com

PHONE 1800 657 601
PRICE \$199.99



With analogue and digital TV tuners plus FM radio on one card, the 310i is the complete package. Software delivers PVR features with recording to DivX or MPEG-2 files, or direct to DVD. A remote control is included, and you can even digitise analogue home videos.

best overall

Leadtek WinFast TV2000 XP Expert

CONTACT Compucon
ONLINE www.compucon.com.au

PHONE (02) 9496 5888
PRICE \$95



A very affordable analogue TV and FM radio card. Setup's not the easiest, nor the software the slickest on the market, but there's plenty of features — including a remote control — for your money, and it delivers good results. PVR functions include time-slip. Nice.

best value

Don't get pwned by a noob! Get a Targus laser mouse & improve your frag rate!



Say hello to laser technology with Targus' range of laser mice. All our laser mice utilise the latest in laser technology providing 20 times more tracking sensitivity than typical optical mice, for greater accuracy and improved use on shiny surfaces – ideal for gamers, graphic designers or those who simply demand maximum accuracy. Increase productivity with the desktop models (AMW14US & AMU14US) with convenient preprogrammed buttons that provide simple and efficient short cuts for Windows use.

Loaded with the same high performance laser engine as their bigger brothers are the notebook models (AMW15US & AMU18US). Lightweight and compact they are ideal for travel, small hands and when desk space is at a premium.

Available Models:

- A. Wireless Desktop Laser Mouse (AMW14US RRP: \$79.95)
- B. Desktop Laser Mouse (AMU14US RRP: \$59.95)
- C. Wireless Notebook Laser Mouse (AMW15US RRP: \$79.95)
- D. Retractable Notebook Laser Mouse (AMU18US RRP: \$59.95)



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Prices, features & specifications are subject to change without any notice.





media adaptors

Zenonic Z500 HD Network DVD player

CONTACT Zenonic PHONE (08) 8322 9544
ONLINE www.zenonic.com.au PRICE \$569

If you want to get your digital media from the study to the lounge room, the Z500 can handle anything you throw at it. It's a progressive-scan MPEG4/DVD player with HDCP-compatible HDMI, plus built-in Ethernet and 802.11b/g for streaming internet access and playing music, photos and movies from any PC on your home network.



best overall

Zenonic Z340 DVD/MPEG4 player

CONTACT Zenonic PHONE (08) 8322 9544
ONLINE www.zenonic.com.au PRICE \$169

Practically anything you can burn to disc or copy to a memory card — whether it's music, photos or movies — the Zenonic Z340 DVD/MPEG4 player can play. A region-free progressive-scan DVD player, will convert NTSC DVDs to PAL (and vice versa). It also sports VGA and component video outputs, along with built-in surround sound decoding.



best value

HD LCD televisions

Loewe Xelos A 37 DVB-TC

CONTACT International Dynamics PHONE (03) 9429 0822
ONLINE internationaldynamics.com.au PRICE \$6,499



Big LCD TVs are ready for prime time, but it's hard to find them with built-in digital tuners. The Xelos A 37 DVB-TC provides 94cm of widescreen goodness and, for an extra \$1,000, comes with a dual SD tuner and built-in 80GB hard drive recorder.

best overall

Panasonic TX-27LWD500A

CONTACT Panasonic PHONE 13 26 00
ONLINE www.panasonic.com.au PRICE \$2,799



Built-in analogue/SD/HD tuners help the Panasonic TX-27LWD500A stand out as an excellent starting point for getting HD action into your lounge room. Along with a 68cm wide-screen and HDCP-compatible HDMI input, it's also got a 6-in-1 memory card reader.

best value

personal video recorders

Topfield TF5000PVRT Masterpiece

CONTACT Topfield PHONE 1300 889 803
ONLINE www.topfield.com.au PRICE \$1,199

If you're ready to revolutionise your TV viewing, this'll let you skip ads, pause live TV and record two programs at once. It sports twin SD digital tuners and a 160GB hard drive, plus the Ice TV Electronic Program Guide lets you "set and forget" the Masterpiece and never miss your favourite show again.

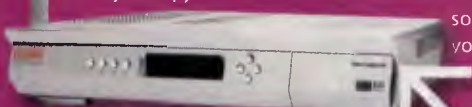


best overall

Legend Digital LPVR080

CONTACT Legend Digital PHONE (02) 8223 9656
ONLINE www.legenddigital.com PRICE \$600

The Legend Digital LPVR080 also sports twin standard-definition digital tuners along with an 80GB hard drive (up to 400GB is available). Along with PVR features like pausing live TV and ICE TV-compatibility, it lets you copy across MP3 and JPEG files from your computer via USB so you can play them on your TV and stereo.



best value

handheld media players

Archos AV500 Digital Video Recorder

CONTACT World Tech PHONE (03) 9310 3497
ONLINE www.worldtech.com.au PRICE \$945 (30GB)

Forget about dinky mobile phones and MP3 players touting fuzzy video clips — the AV500 sports a beautiful 10.2cm screen. Up to 100GB of storage puts your entire movie collection in your pocket, and you can record from external video sources.



best overall

Archos Gmini 402

CONTACT World Tech PHONE (03) 9310 3497
ONLINE www.worldtech.com.au PRICE \$599

The 20GB Archos Gmini 402 weighs in at only 160g and sports a 5.6cm display. It's a USB 2.0 storage device with TV-out which can also record from external audio sources. It can do handheld gaming or act as a USB host for downloading directly from a digital camera.



best value

BROADBAND 512k

GENEROUS 20GB (20,000MB) DOWNLOADS~



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TPG Broadband is available nationwide, excl. Tas, subject to availability. ~ Speed will be throttled to 64k once 20GB is reached until the start of the next billing month. * Free 1 Ethernet Port Modem offer excludes churn/transfer customers. Modem delivery is optional. A \$10 fee applies if not collected from 65 Waterloo Rd. North Ryde NSW 2113. # Monthly payment by Credit Card or Direct Debit. Total minimum cost over 6 months is \$428.70 (includes once-off setup cost of \$129). Prices are subject to change without notice. Full terms & conditions apply. See www.tpg.com.au for details. TPG Internet Pty Ltd 65 Waterloo Rd. North Ryde NSW 2113 ABN 15 068 383 737.



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Rejected for ADSL? Try again.

What qualifies as disqualification? Telstra changes the ADSL rules. *Dan Warne reports.*

Telstra has tweaked its "service qualification" process that determines whether you can receive ADSL on your phone line.

The test is now more generous to customers; people who didn't qualify previously, due to what Telstra said was excessive signal loss, may now be able to get it.

The change of heart stems from Telstra's discovery that "bridge taps", a commonly used piece of technology on their network, weren't actually causing signal loss on phone lines — too much signal loss disrupts ADSL connection.

Bridge taps are where a telco runs a phone line past several different locations (such as a number of street-side pillars) and "taps into" the phone line where necessary.

The technology was designed in the days of "party lines", where multiple customers would share a line, but they are still used in modern networks to allow telcos to easily reassign phone lines running from the exchange to someone else's house (if a customer disconnects their service).

Bridge taps are thought to create problems for ADSL, because the modem signal bounces around the line between the taps and degrades the overall signal quality.

However, Telstra admitted in February it had discovered that in reality the impact of bridge taps was negligible and that it would no longer consider them in ADSL service qualification tests.



Thumbs up: would you accept a service qualification from this man?

in brief

DUAL-CORE ROUTER RELEASED

Australian modem/router distributor Billion has released the ultimate router for geeks (and small businesses): the Biguard-30 can take two internet connections and balance the load between them. If you have a 24Mb/s ADSL2+ connection at home, why not get a second one and load-balance them for 48Mb/s. It'd almost be like living in a country with proper broadband. . . For more, see www.billion.com.au.



BIGPOND "CABLE EXTREME" IS GO

Just after we went to press last month, BigPond gave the commercial go-ahead to double BigPond Cable's speed. Users can now upgrade their plans to one of the "Cable Extreme" 17Mb/s plans for an extra \$10 per month. However, the telco did not throw in any extra download allowance — although it launched a new \$159.95 plan with 60GB of usage.



your monthly broadband guide

APC is proud to partner with the independent broadband price monitoring service Broadband Choice (broadbandchoice.com.au) to bring you the best ADSL and cable deals.

The comparison table on the following pages focuses on internet service providers that best serve the majority of APC readers' needs — those that have national coverage (though we have included some ISPs that provide higher than 2Mb/s speed services in limited areas).

Only those meeting at least three of our four plan selection criteria are listed:

▪ Budget plan: cheapest deal under \$35/month.

▪ Light plan: cheapest deal under \$65/month, with at least 512Kb/s speed and 1GB data.

▪ Family plan: largest download allowance under \$80/month, at least 512Kb/s and 10GB data.

▪ High speed: cheapest 1.5Mb/s plan under \$100/month, with 10GB data minimum.

If an ISP has "unlimited downloads" but speed is throttled after reaching a certain limit, the portion in which you can get full-speed downloads is listed as its limit.

APC has picked the lowest price for a contract period of six months or less for broadband installation. Otherwise, the lowest-priced option was selected.

The installation price doesn't include a modem because you may find you'll get better value by buying one separately.

Can't find your provider in our list? That's because some of the largest ISPs, and many smaller ones, didn't meet the selection criteria. There may be ISPs we didn't list that will provide better deals but only service your local area or state.

ISPs enter their own information into the Broadband Choice database. ISPs can contact bc@whirlpool.net.au for more details on how to become part of the database.

Data for our table was extracted from the Broadband Choice database on 23 February 2006.



Name	Phone	Online	Budget plan (under \$35)	Light plan (under \$60, at least 512Kb/s, minimum 1GB data limit)	Family plan (under \$80, at least 512Kb/s, minimum 1GB data limit)	High-speed plan (under \$100, at least 1.5Mb/s, minimum 10GB data limit)	National	Spam filtering	Setup fee & contract length	Rapid transfer
Superfast broadband ISPs (faster than 1.5Mb/s)										
iNet broadband2+ ADSL (24Mb)	13 19 17	www.inet.net.au	\$29.95† 600MB 24Mb/s	\$39.95† 4GB+ 24Mb/s	\$69.95† 20GB+ 24Mb/s	\$49.95† 10GB+ 24Mb/s	✓	✓	\$119 6mths	✗
Internode Extreme ADSL2+	13 66 33	www.internode.on.net	N/A	\$59.95 20GB 24Mb/s	\$79.95 40GB 24Mb/s	\$59.95 20GB 24Mb/s	✗	✓	\$129 6mths	✗
iPrimus up to 8000Kbps	1300 854 848	www.iprimus.com.au	\$29.95† 1GB 8Mb/s	\$29.95† 1GB 8Mb/s	\$69.95† 20GB 8Mb/s	\$49.95† 10GB 8Mb/s	✓	\$2	\$119 12mths	✗
OptusNet Cable	1800 504 504	http://broadbandsales. optusnet.com.au	\$29.95† 300MB+ 10Mb/s	\$39.95† 2GB+ 10Mb/s	\$69.95† 20GB+ 10Mb/s	\$69.95† 20GB+ 10Mb/s	✗	✓	\$39 12mths	✗
broadband2+ 24Mb	13 35 93	www.ozemail.com.au	\$29.95† 600MB 24Mb/s	\$39.95† 4GB+ 24Mb/s	\$69.95† 20GB+ 24Mb/s	\$49.95† 10GB+ 24Mb/s	✓	✓	\$119 6mths	✗
Primus-AOL 2000K+	1800 265 777	www.primusonline.com.au	\$29.95* 400MB 2Mb/s	\$49.95 12GB 2Mb/s	\$49.95 12GB 2Mb/s	\$49.95 12GB 2Mb/s	✗	✗	\$149 3mths	✗
Telstra BigPond Cable	13 12 82	www.bigpond.com	\$29.95* 200MB^ 10Mb/s	\$59.95† 10GB^ 10Mb/s	\$59.95† 10GB^ 10Mb/s	\$59.95† 10GB^ 10Mb/s	✗	\$2.50	\$189 12mths	✗

Regular broadband ISPs (1.5Mb/s or less)

AAPT smartchat	13 88 88	www.aapt.com.au	\$29† 500MB 256Kb/s	\$39† 12GB 512Kb/s	\$59† 15GB 1.5Mb/s	\$59† 15GB 1.5Mb/s	✓	✓	\$0 1mth	✗
Aardvark Internet	1800 227 382	www.aardvark.net.au	\$29.95* 200MB 256Kb/s	\$45* 1.5GB 512Kb/s	\$78.50 30GB 512Kb/s	\$84.50 10GB 1.5Mb/s	✓	✓	\$130 6mths	✓
Alphalink	1300 360 638	http://home.alphalink.com.au	\$29.70* 200MB 256Kb/s	\$44.90 1GB 512Kb/s	\$69.90 10GB 512Kb/s	\$99.90 10GB 1.5Mb/s	✓	✓	\$121 1mth	✓
Aspark ADSL	1300 662 300	www.aspark.com.au	\$27.95† 15GB 256Kb/s	\$39.95† 25GB 512Kb/s	\$39.95† 25GB 512Kb/s	\$85 35GB 1.5Mb/s	✓	✓	\$110 1mth	✓
AuNix Broadband	1300 765 742	www.aunix.com.au	\$29.95* 15GB 256Kb/s	\$39.95* 25GB 512Kb/s	\$66.95* 35GB 1.5Mb/s	\$66.95* 35GB 1.5Mb/s	✓	✓	\$99 1mth	✓
Australis Internet ADSL	1300 722 050	www.australis.net	N/A	\$49.95 25GB 512Kb/s	\$75.95 35GB 1.5Mb/s	\$75.95 35GB 1.5Mb/s	✓	✓	\$169 1mth	✓
Australis Internet Bundled ADSL/Phone	1300 722 050	www.australis.net	\$29.95† 1GB 256Kb/s	\$44.95† 25GB 512Kb/s	\$69.95† 35GB 1.5Mb/s	\$69.95† 35GB 1.5Mb/s	✓	✓	\$169 1mth	✓
Aztec ISP Home broadband	1300 768 513	www.aztec.aunz.com	N/A	\$44.95 25GB 512Kb/s	\$74.95 35GB 1.5Mb/s	\$74.95 35GB 1.5Mb/s	✓	✓	\$129 12mths	✓
BIT.net	1300 248 638	www.b.net.au	\$31.95 2GB 256Kb/s	\$41.95 2GB 512Kb/s	\$69.95 No limit 512Kb/s	\$89.95 25GB 1.5Mb/s	✓	✓	\$99 6mths	✓
BKB Internet Residential ADSL	1800 252 638	www.bkb.net.au	N/A	\$49.95 1GB 512Kb/s	\$69.95 10GB 512Kb/s	\$99.95 10GB 1.5Mb/s	✓	✓	\$139 6mths	✓
Blackstump Solutions ADSL	1800 890 600	www.blackstump.net.au	\$32.95* 500MB^ 256Kb/s	\$39.95* 5GB^ 512Kb/s	\$74.95 35GB^ 1.5Mb/s	\$67.95* 10GB^ 1.5Mb/s	✓	✓	\$108 1mth	✓
Brown Bear ADSL / VOIP	1300 730 720	www.brownbear.net.au	N/A	\$47† 10GB 512Kb/s	\$54† 30GB 512Kb/s	\$87† 10GB 1.5Mb/s	✓	✓	\$119 6mths	✓
CEInternet Broadband	1800 222 256	www.ceinternet.com.au	\$29.95* 200MB 256Kb/s	N/A	\$79.95 10GB 512Kb/s	\$99.95 10GB 1.5Mb/s	✓	\$2.50	\$99 1mth	✓
Cheetah by Ozleweb	1300 727 374	www.cheetah.net.au	\$29.95* 200MB 256Kb/s	N/A	\$69.95 15GB 512Kb/s	\$99.95 15GB 1.5Mb/s	✓	✓	\$129 6mths	✓
Comcen Internet	1300 300 324	www.comcen.com.au	\$19.95* 200MB 256Kb/s	\$39.95* 1GB+ 512Kb/s	\$79.99 No limit 512Kb/s	\$69.95* 15GB+ 1.5Mb/s	✓	✓	\$99 6mths	✓
ComeOnAussie Home ADSL	1300 361 317	www.comeonaussie.net	\$34.95* 1GB 256Kb/s	\$41.95* 2GB 512Kb/s	\$74.95† 35GB 1.5Mb/s	\$74.95† 35GB 1.5Mb/s	✓	✓	\$179 1mth	✓
ComeOnAussie Business ADSL	1300 361 317	www.comeonaussie.net	N/A	\$49.95* 25GB 512Kb/s	\$79.95* 35GB 1.5Mb/s	\$79.95* 35GB 1.5Mb/s	✓	✓	\$179 6mths	✓
Concept Networks Stamina	1300 132 331	www.conceptual.net.au	\$29.95* 250MB 256Kb/s	\$59.95* 16GB 512Kb/s	\$69.95 No limit 512Kb/s	N/A	✓	✓	\$99 6mths	✓
Connexus Home ADSL	1300 133 888	www.connexus.net.au	\$27.95* 200MB^ 256Kb/s	\$59.95 10GB^ 512Kb/s	\$59.95 10GB^ 512Kb/s	N/A	✓	✓	\$149 6mths	✗
Crazy Broadband	1300 248 638	www.crazy.com.au	\$29.95* 250MB 256Kb/s	\$42.95 2GB 512Kb/s	\$49.95 20GB 512Kb/s	\$82.95 20GB 1.5Mb/s	✓	✓	\$140 6mths	✓
Curl DSL	1300 135 908	http://curl.com.au	\$29.95† 15GB 256Kb/s	\$39.95† 25GB 512Kb/s	\$64.95† 35GB 1.5Mb/s	\$64.95† 35GB 1.5Mb/s	✓	✓	\$99 6mths	✓
Cybernet ADSL	1300 133 599	www.cybernetinternet.com	\$29* 1GB 256Kb/s	\$39* 1GB 512Kb/s	\$79.95 35GB 1.5Mb/s	\$79.95 35GB 1.5Mb/s	✓	\$5.50	\$49 12mths	✓
CyberOne ADSL	1300 720 062	www.cyberone.com.au	\$15.95* 200MB 256Kb/s	\$54.95 No limit 512Kb/s	\$54.95 No limit 512Kb/s	\$84.95 No limit 1.5Mb/s	✓	✓	\$0 1mth	✓
DCSI	1300 665 575	www.dcsi.net.au	\$29.95 500MB 256Kb/s	\$49.95 10GB 512Kb/s	\$59.95 20GB 512Kb/s	\$79.95 20GB 1.5Mb/s	✓	✓	\$125 6mths	✓
Dodo	13 16 02	www.dodo.com.au	\$19.90† 250MB^ 256Kb/s	\$34.90† 1GB^ 512Kb/s	\$64.90† No limit 512Kb/s	\$64.90† 30GB^ 1.5Mb/s	✓	\$1.90	\$119 1mth	✓
DragNet Budget ADSL	1800 069 050	www.dragnet.com.au	\$26.95* 200MB^ 256Kb/s	N/A	\$69.95 10GB^ 512Kb/s	\$95.95 10GB^ 1.5Mb/s	✓	✓	\$100 6mths	✓
E SOUL	1300 367 258	www.esoul.net.com.au	N/A	\$59.95 25GB 512Kb/s	\$59.95 25GB 512Kb/s	\$99.95 35GB 1.5Mb/s	✓	✓	\$129 6mths	✓
Empcom ADSL Service	1300 731 368	www.empcom.net	\$25 1GB 256Kb/s	\$35 1GB 512Kb/s	\$65 No limit 512Kb/s	\$75 10GB 1.5Mb/s	✓	✓	\$129 6mths	✓
FutureWeb Pty Ltd	1300 361 355	www.futureweb.com.au	\$31.95* 200MB 256Kb/s	\$49.95 1.5GB 512Kb/s	\$73.95 15GB 512Kb/s	N/A	✓	✓	\$120 6mths	✓
Gday.net ADSL Broadband	1300 668 640	http://telecom.gday.net	\$24.95* 300MB^ 256Kb/s	N/A	\$69.95 10GB^ 512Kb/s	\$99.95 10GB 1.5Mb/s	✓	✗	\$129 1mth	✓
Glocomm Broadband - ADSL	1300 728 392	www.glocomm.net.au	\$32.95* 500MB 256Kb/s	\$46.95* 3GB 512Kb/s	\$72.95 35GB 1.5Mb/s	\$72.95 35GB 1.5Mb/s	✓	✓	\$179 1mth	✓
Goldlink ADSL	1300 654 024	www.goldlink.com.au	\$29.95 500MB 256Kb/s	\$49.95 25GB 512Kb/s	\$69.95 35GB 1.5Mb/s	\$69.95 35GB 1.5Mb/s	✓	✓	\$99 6mths	✓
Goldweb ADSL	1300 366 065	www.goldweb.com.au	\$29.95* 200MB 256Kb/s	\$55 1.5GB 512Kb/s	\$80 15GB 512Kb/s	N/A	✓	✓	\$139 1mth	✓
Hande Communications xDSL	1300 306 131	www.hande.com.au	\$29.95 1GB 256Kb/s	\$39.95 5GB 512Kb/s	\$64.95 15GB 1.5Mb/s	\$64.95 15GB 1.5Mb/s	✓	✓	\$119.95 1mth	✓
Hylinx ADSL	1300 132 014	www.hylinx.com	N/A	\$39.95† 25GB 512Kb/s	\$69.95† 35GB 1.5Mb/s	\$69.95† 35GB 1.5Mb/s	✓	✓	\$129 6mths	✓
iNet broadband1 ADSL	13 19 17	www.inet.net.au	\$29.95† 600MB 512Kb/s	\$39.95† 4GB+ 512Kb/s	\$69.95† 20GB+ 1.5Mb/s	\$49.95† 10GB+ 1.5Mb/s	✓	✓	\$119 6mths	✓
Infinity Plus Residential DSL	1300 726 340	www.infinityplus.net.au	N/A	\$49.95† 25GB 512Kb/s	\$79.95† 30GB 1.5Mb/s	\$79.95† 30GB 1.5Mb/s	✓	✓	\$100 6mths	✓
Instant Communications ADSL	1300 139 369	www.in.com.au	N/A	\$59.95 No limit 512Kb/s	\$59.95 No limit 512Kb/s	\$99.95 50GB 1.5Mb/s	✓	✓	\$99 6mths	✓
IntegrityNet ADSL	1300 884 337	www.integritynet.com.au	\$29.95* 200MB 256Kb/s	\$59.95* 5GB 512Kb/s	\$69.95* 10GB 512Kb/s	\$99.95* 10GB 1.5Mb/s	✓	✓	\$139 12mths	✓

Name	Phone	Online	Budget plan (under \$35)	Light plan (under \$60, at least 512Kb/s, minimum 1GB data limit)	Family plan (under \$80, at least 512Kb/s, minimum 10GB data limit)	High-speed plan (under \$100, at least 1.5Mb/s, minimum 10GB data limit)	National	Spam filtering	Setup fee & contract length	Rapid transfer
Regular broadband ISPs (1.5Mb/s or less)										
Internode Home ADSL	13 66 33	www.internode.on.net	\$29.95 500MB 256Kb/s	\$39.95 8GB 512Kb/s	\$69.95 40GB 512Kb/s	\$59.95 10GB 1.5Mb/s	✓	✓	\$129 6mths	✓
Internode SOHO ADSL	13 66 33	www.internode.on.net	N/A	\$59.95 10GB 512Kb/s	\$69.95 20GB 512Kb/s	\$79.95 10GB 1.5Mb/s	✓	✓	\$129 6mths	✓
iPrimus Flexible Broadband	1300 854 848	www.iprimus.com.au	\$19.95† 500MB 256Kb/s	\$29.95† 1GB 512Kb/s	\$69.95† 20GB 1.5Mb/s	\$59.95† 12GB 1.5Mb/s	✓	\$2	\$119 12mths	✗
iSage Internet ADSL	1300 725 789	www.isage.aunz.net	\$29.95† 15GB 256Kb/s	\$39.95† 25GB 512Kb/s	\$69.95† 35GB 1.5Mb/s	\$69.95† 35GB 1.5Mb/s	✓	✓	\$119 1mth	✓
ispace ADSL	1300 769 615	www.ispace.net.au	\$29.95* 200MB 256Kb/s	\$59.95* 2GB 512Kb/s	\$79.95* 20GB 512Kb/s	N/A	✓	✓	\$120 6mths	✓
Jumba Broadband	1300 855 554	www.jumba.com.au	N/A	\$45.95* 20GB 512Kb/s	\$55.95* 35GB 512Kb/s	\$69.95* 20GB 1.5Mb/s	✓	✓	\$139 6mths	✓
Lets Go ADSL	1300 556 114	www.letsgo.com.au	N/A	\$59.95 30GB 512Kb/s	\$59.95 30GB 512Kb/s	\$99.95 30GB 1.5Mb/s	✓	✓	\$99 6mths	✓
Lucidity Communications ADSL	1300 768 146	www.lucidity.net.au	N/A	\$59.95† 25GB 512Kb/s	\$79.95† 35GB 1.5Mb/s	\$79.95† 35GB 1.5Mb/s	✓	✓	\$120 1mth	✓
Matilda Internet DSL	1300 665 865	www.matilda.net.au	\$29.95* 200MB 256Kb/s	\$49.95* 1GB 512Kb/s	\$59.95 10GB 512Kb/s	\$89.95 10GB 1.5Mb/s	✓	✓	\$110 1mth	✓
Midcoast Internet	1300 134 638	www.midcoast.com.au	\$28.50* 200MB ⁺ 256Kb/s	N/A	\$71.50* 10GB ⁺ 512Kb/s	\$98* 10GB ⁺ 1.5Mb/s	✓	✓	\$130 6mths	✓
Mydoor.com.au ADSL	1300 736 783	www.mydoor.com.au	\$34.95 500MB 256Kb/s	\$44.95 1.5GB 512Kb/s	\$79.95 30GB 512Kb/s	\$89.95 15GB 1.5Mb/s	✓	✓	\$110 6mths	✓
NCD ADSL	1300 768 433	www.ncd.net.au	\$29.95* 1GB 256Kb/s	\$39.95* 2GB 512Kb/s	\$74.95 35GB 1.5Mb/s	\$69.95* 15GB 1.5Mb/s	✓	✗	\$125 6mths	✓
Neighbourhood Cable	1300 366 248	www.ncable.net.au	\$27.95* 200MB 256Kb/s	N/A	\$69.95 10GB 512Kb/s	\$99.95 10GB 1.5Mb/s	✓	✓	\$99 12mths	✓
Netbay Xtreme DSL	1300 733 215	www.netbay.com.au	\$29.95* 500MB 256Kb/s	\$39.95* 1GB 512Kb/s	\$49.95* 10GB 512Kb/s	\$69.95* 10GB 1.5Mb/s	✓	✓	\$99 12mths	✓
Netspace Home ADSL	13 14 56	www.netspace.net.au	\$29.95* 300MB 256Kb/s	\$39.95 1GB+ 512Kb/s	\$59.95 25GB+ 512Kb/s	\$79.95 20GB+ 1.5Mb/s	✓	✓	\$109 6mths	✓
Netspace SOHO ADSL	13 14 56	www.netspace.net.au	N/A	\$59.95 15GB 512Kb/s	\$59.95 15GB 512Kb/s	\$99.95 20GB 1.5Mb/s	✓	✓	\$109 6mths	✓
North Queensland Telecom ADSL	1300 664 178	www.nqtelecom.com.au	N/A	\$59.95 25GB 512Kb/s	\$59.95 25GB 512Kb/s	\$89.95 35GB 1.5Mb/s	✓	✓	\$90 1mth	✓
OptraWeb ADSL/VOIP	1300 730 720	www.optraweb.com.au	N/A	\$48† 10GB 512Kb/s	\$55† 30GB 512Kb/s	\$88† 10GB 1.5Mb/s	✓	✓	\$119 6mths	✓
OzEmail broadband1	13 35 93	www.ozemail.com.au	\$29.95† 600MB 512Kb/s	\$39.95† 4GB+ 512Kb/s	\$69.95† 20GB+ 1.5Mb/s	\$49.95† 10GB+ 1.5Mb/s	✓	✓	\$119 6mths	✓
OzForces Residential ADSL	1300 134 081	www.ozforces.com	\$24.95* 200MB 256Kb/s	N/A	\$68.95 No limit 1.5Mb/s	\$89.95 No limit 1.5Mb/s	✓	✓	\$119 6mths	✓
OzISP ADSL	1300 654 653	www.ozisp.com.au	N/A	\$48.40 1.5GB 512Kb/s	\$79.75 30GB 512Kb/s	\$93.50 15GB 512Kb/s	✓	\$2.75	\$132 6mths	✓
Ozziehost ADSL	1300 769 615	www.ozziehost.net.au	\$29.95* 200MB 256Kb/s	\$59.95* 2GB 512Kb/s	\$79.95* 20GB 512Kb/s	N/A	✓	✓	\$120 6mths	✓
Pacific Internet DSL	13 36 35	www.pacific.net.au	\$29.95* 250MB 256Kb/s	\$39.95 1GB 512Kb/s	\$54.95 No limit 512Kb/s	N/A	✓	✓	\$99 6mths	✓
Primus-AOL Standard	1800 265 777	www.primusonline.com.au	\$24.95* 300MB 256Kb/s	\$49.95 2GB 512Kb/s	\$69.95 12GB 512Kb/s	N/A	✓	✗	\$149 3mths	✗
Qualmark Online	1300 138 558	www.qualmarkonline.com.au	N/A	\$53.50 5GB 512Kb/s	\$69.95 15GB 512Kb/s	\$89.95 10GB 1.5Mb/s	✓	✗	\$129 6mths	✓
Rabbit Internet ADSL	1800 501 106	http://rabb.com.au	\$16.50†* 200MB 256Kb/s	\$35.15†* 1GB 512Kb/s	\$51.38†* 30GB 512Kb/s	\$71.41†* 10GB 1.5Mb/s	✓	✓	\$99 6mths	✓
Rapid Net ADSL	1300 724 677	www.rapidnet.com.au	\$29.95* 200MB 256Kb/s	\$49.95 25GB 512Kb/s	\$79.95 35GB 512Kb/s	\$79.95 35GB 1.5Mb/s	✓	✓	\$119 12mths	✓
REEDS.NET Internet Services	1300 798 801	www.reeds.net.au	N/A	\$44.95 25GB 512Kb/s	\$79.95 35GB 1.5Mb/s	\$79.95 35GB 1.5Mb/s	✓	✓	\$145 6mths	✓
Reset Residential xDSL	1300 662 670	www.reset.net.au	\$29.95* 500MB 256Kb/s	\$49.95 25GB 512Kb/s	\$49.95 25GB 512Kb/s	\$89.95 35GB 1.5Mb/s	✓	✓	\$99 12mths	✓
Schaelec Residential Grade DSL	1300 554 687	www.schaelec.com.au	\$24.95†* 500MB 256Kb/s	\$37.95† 25GB 512Kb/s	\$65.95† 35GB 1.5Mb/s	\$65.95† 35GB 1.5Mb/s	✓	✓	\$159 6mths	✓
Schaelec Business Grade DSL	1300 554 687	www.schaelec.com.au	N/A	\$54.95†* 25GB 512Kb/s	\$79.95†* 35GB 1.5Mb/s	\$79.95†* 35GB 1.5Mb/s	✓	✓	\$159 6mths	✓
Southern Phone National ADSL	13 14 64	http://southernphone.com.au	N/A	\$49.95† 25GB 512Kb/s	\$49.95† 25GB 512Kb/s	\$89.95† 35GB 1.5Mb/s	✓	✓	\$99 12mths	✓
Spin Internet	1300 303 375	www.spin.net.au	\$19.99* 200MB 256Kb/s	\$39.99* 1GB+ 512Kb/s	\$79.99 No limit 512Kb/s	\$69.99* 15GB+ 1.5Mb/s	✓	✓	\$99 6mths	✓
ST ADSL Internet	1300 138 177	www.stelecom.com.au	\$29.70* 200MB 256Kb/s	N/A	\$69.96 10GB 512Kb/s	\$99.99 10GB 1.5Mb/s	✓	✗	\$99 6mths	✓
TeeGee Internet ADSL	1300 731 132	www.teege.com.au	\$29.95* 15GB 256Kb/s	\$39.95* 25GB 512Kb/s	\$69.95* 35GB 1.5Mb/s	\$69.95* 35GB 1.5Mb/s	✓	✓	\$99 1mth	✓
telaustalia SME & Res	1300 783 528	http://telaustalia.com.au	N/A	\$49.95 25GB 512Kb/s	\$79.95 35GB 1.5Mb/s	\$79.95 35GB 1.5Mb/s	✓	✗	\$120 6mths	✓
Telstra BigPond ADSL	13 12 82	www.bigpond.com	\$29.95* 200MB ⁺ 256Kb/s	N/A	\$69.95† 10GB ⁺ 512Kb/s	\$99.95† 10GB ⁺ 1.5Mb/s	✓	\$2.50	\$99 12mths	✓
TSN Broadband	13 14 86	http://inweb.tsn.cc	\$29.95 No limit 256Kb/s	\$39.95 No limit 512Kb/s	\$39.95 No limit 512Kb/s	\$69.95 No limit 1.5Mb/s	✓	✓	\$129 6mths	✓
Velocity Internet ADSL	1300 557 300	www.velocitynet.com.au	\$29.95* 300MB 256Kb/s	\$49.50* 4GB 512Kb/s	\$79.50* 50GB 512Kb/s	\$89.50* 24GB 1.5Mb/s	✓	✓	\$69 6mths	✓
VitalTel ADSL Broadband	1300 858 706	www.vitaltel.com.au	\$24.95* 200MB 256Kb/s	\$59.95 10GB 512Kb/s	\$59.95 10GB 512Kb/s	\$79.95 10GB 1.5Mb/s	✓	✓	\$139.95 1mth	✓
Web Ace ADSL	1800 202 012	www.webace.com.au	\$28.95* 250MB 256Kb/s	\$39.95† 1GB 512Kb/s	\$56.95† 30GB 512Kb/s	\$92.95† 20GB 1.5Mb/s	✓	✓	\$119 6mths	✓
Webzone	1300 303 932	www.webzone.net.au	\$32.95 1GB 256Kb/s	N/A	\$79.95 30GB 512Kb/s	\$99.95 10GB 1.5Mb/s	✓	✓	\$149 6mths	✓
WA Budget ADSL	1300 365 678	www.westnet.net.au	\$29.95 500MB 256Kb/s	\$39.95 1GB 512Kb/s	\$79.95 No limit 512Kb/s	\$69.95 10GB+ 1.5Mb/s	✓	\$4.16	\$99 12mths	✓
Westnet Home ADSL	13 19 60	http://westnet.com.au	\$19.95* 200MB 256Kb/s	\$39.95 1GB 512Kb/s	\$79.95 30GB+ 512Kb/s	\$69.95 10GB+ 1.5Mb/s	✓	\$0.83	\$99 6mths	✓
Wild Internet ADSL + Phone	1800 809 453	www.wildsl.com.au	\$31.95† 15GB 256Kb/s	\$39.95† 25GB 512Kb/s	\$59.95† No limit 512Kb/s	\$69.95† 35GB 1.5Mb/s	✓	✓	\$99 1mth	✓
Wild IT Budget DSL + Phone	1800 809 453	www.wildsl.com.au	\$28.95†* 5GB 256Kb/s	\$34.95†* 10GB 512Kb/s	\$64.95†* 20GB 1.5Mb/s	\$64.95†* 20GB 1.5Mb/s	✓	✓	\$99 1mth	✓
Yaussie Net ADSL	1300 883 352	www.yaussie.com.au	\$29.95* 1GB 256Kb/s	\$36.95* 1GB 512Kb/s	\$65.95† 35GB 1.5Mb/s	\$65.95† 35GB 1.5Mb/s	✓	✓	\$110 6mths	✓
ZCTS ADSL	1300 852 949	www.zcts.net	\$29.95* 500MB 256Kb/s	\$44 25GB 512Kb/s	\$73.50 35GB 1.5Mb/s	\$73.50 35GB 1.5Mb/s	✓	✓	\$110 1mth	✓

Key: * ISP charges excess usage fees when you exceed your download limit; † This price only available if bundled with long distance telephony from the ISP.
+ Additional download allowance available with this plan for use in off-peak periods; ^ ISP combines sent and received data when calculating usage.

International BRAND merger

What does Lenovo's takeover of the IBM PC company mean for the product range? *Adam Turner* investigates.



Alan Munro, Lenovo's Australian and New Zealand general manager.

The Chinese don't like to do things by halves — when Chinese computing company Lenovo heard the saying “no-one ever got fired for buying IBM”, it went out and bought IBM's entire PC business.

The deal, worth US\$1.75 billion, made Lenovo the world's third largest PC maker behind Dell and Hewlett-Packard. Lenovo also gained IBM's iconic ThinkPad notebook and ThinkCentre desktop ranges, plus the right to keep using the IBM logo for five years.

Lenovo, formerly known as Legend Group, is the largest PC manufacturer in the People's Republic of China — and is part-owned by the Chinese Government. As the first

anniversary of the deal approaches on 1 May 2006, Lenovo has already released the new generation of Lenovo-built ThinkPads and ThinkCentres. It is also launching an assault on Australia's consumer and small business markets with the release of Lenovo-branded desktops and notebooks.

So is a ThinkPad still a ThinkPad? International Business Machines is one of the world's most trusted names in computing and was there at the very beginning of the PC revolution. Inversely, not so long ago, “Made in China” stickers had a reputation for being found on cheap plastic toys. Japan, Taiwan and Korea started the same way — but have gained a global respect which China is still chasing.

LENOVO THINK HISTORY

IBM's Think range were flagship products for a company which meant business when it came to business tools.

Lenovo's first foray into the Think range was also the ThinkPad's first foray into the Tablet PC market. The ThinkPad X41, released in the middle of 2005, tips the scales at 1.8kg and the keyboard can fold away under the 12in display to create a Tablet PC. One of the lightest Tablet PCs on the market, partially thanks to the lack of an optical drive, it still offers a 1.5GHz Pentium M processor. Also onboard are Gigabit Ethernet, 802.11a/b/g,

联想



AUSTRALIAN THINKPADS WILL STILL BE MADE BY THE SAME WORKERS, IN THE SAME FACTORIES

Like many multinational computer vendors, IBM has been moving away from manufacturing, to focus on design and marketing. During the last few years it has sold off several of its PC factories including its hard drive division.

Last year Lenovo bought the rest of IBM's PC unit — lock, stock and barrel. Around 9,500 former IBM staff now work for Lenovo, joining 10,000 staff from Lenovo's PC business and 7,500 staff in its

mobile handset business. The acquisition included research and development centres as well as the factories where IBM made its ThinkPads. So, Australian ThinkPads will continue to be made by the same workers, in the same factories — just with a different logo on their shirts.

Andy Woo, PC analyst with global consulting group Gartner, says the majority of people realise that most computing and consumer electronics equipment

is made in Asia, so the move to Lenovo should have little impact on people's confidence in ThinkPads.

Computer hardware has become heavily commoditised. Much of the difference between vendors comes

Bluetooth, two USB 2.0 ports, a PC Card slot and an SD memory card reader (plus a built-in fingerprint reader).

Lenovo's next ThinkPad was another first — the Z60 introduced a DVD-friendly 14 or 15in widescreen display into a product range previously known for being all work and no play. It is also available in a brushed-titanium finish, another first for the all-black ThinkPad. The most consumer-focused ThinkPad to date, the high-end Z60m sports a 2GHz Pentium M processor and ATI Radeon X600 graphics card (but still features all of the business and connectivity features of a standard ThinkPad — such as a fingerprint reader).

The Pentium 4-based ThinkCentre E50 was Lenovo's first desktop, with a 2.93GHz processor offering plenty of grunt — but the integrated SiS graphics ensured it was work-focused.

Lenovo continues to break new ground with the ThinkPad range, with this year's T60 and X60 providing the first ThinkPads built around dual-core processors. Weighing in at 2.3 and 1.7kg respectively, they offer built-in access to Vodafone's high-speed 3G wireless network. The T60 features a magnesium alloy "roll cage" and shock-mounted hard drives, plus the T60p is also the first ThinkPad with a 256MB graphics card.



LENOVO 3000 RANGE

This year has seen Lenovo-branded gear emerge from China to compete in the Australian consumer and small business markets.

The Lenovo-branded computers move away from the ThinkPad black, coming in silver and offering a more stylish design. The first members of the Lenovo 3000 range, aimed at small businesses, were released this month: the C100 notebook and the J100/J105 small form factor desktops.

The C100 sports a 4:3, 15in display and Celeron or Pentium M processor (but not dual-core). Weighing in at 2.8kg, the C100 inherits some advanced features from the ThinkPad range, such as the ThinkPad keyboard and LenovoCare — similar to the ThinkVantage advanced maintenance, configuration, backup and help features found on ThinkPads. It doesn't have the ThinkPad's Trusted Platform Module 1.2 security chip for encrypting data.

The J100 and J105 small form factor desktops sport Pentium and AMD processors respectively, with SATA hard drives and up to 1GB of RAM (but only onboard graphics — an empty AGP slot allows you to upgrade). Both the C100 and J100/J105 come with full versions of WordPerfect and WinDVD amongst other software.

April or May will also see Lenovo release more consumer-oriented products. The J100 and J105 tower PC will have more consumer-focused features such as a modem and external speakers. The N100 notebook will be the first Lenovo-branded notebook with a dual-core processor and will also sport a 15in widescreen display. It will also have the LenovoCare features found on the C100 — and some models will include a built-in fingerprint reader and webcam.



Lenovo's chief marketing officer, Deepak Advani.



PUTTING THE CHINESE AT THE HELM OF THE THINK RANGE RAISED SOME EYEBROWS AMONGST CUSTOMERS

down to service and support — which is one reason why you pay a premium from an IBM-branded product.

This commoditisation is one reason IBM sold off its PC division — to focus on more profitable areas such as software, services and consulting. IBM Australia still provides the warranty, service and support for Lenovo-built Think products (as well as the new Lenovo-branded gear). This deal with IBM is for “up to five years” and may be extended further.

This behind-the-scenes relationship between Lenovo and IBM is the “glue holding the deal together,” says Woo.

“There’s no question the relationship Lenovo has with IBM has a lot of clout. Through time that will slowly dilute, which is why Lenovo needs to stand on its own feet, but meanwhile they can ride on the tail coat of the

IBM brand name,” he says. “In the enterprise and professional space, service and support is a very big component of winning or losing a deal.”

While IBM and Lenovo have a very close relationship, for the IBM staff who moved to Lenovo it was more than just a change of business cards. Lenovo staffers will move out of IBM’s Sydney headquarters after the current lease expires — and the restructure sees some former IBM groups reporting to Lenovo managers.

English is now Lenovo’s official language, but there are many internal cultural exchange programs underway — such as online photo diaries and a pen-pal program between the children of Chinese and Western staff.

The challenges of working within a global organisation aren’t foreign to ex-IBM staff, says Peter Hortensius — a former IBMer

who is now senior vice president of Lenovo’s notebook business unit.

“The key to making this kind of thing work is



MARKETING STRATEGY

Spin doctors are working overtime to ensure the IBM magic rubs off on Lenovo before it loses the right to use the IBM logo in 2010.

ThinkPads still sport large IBM logos — which are more prominent in the new ThinkPad advertising campaign than the Lenovo name. Lenovo can't use IBM logos with its own Lenovo 3000 range, turning the brand-building strategy into a game of Chinese whispers.

As for former IBM corporate customers, Lenovo worked hard to reassure them they had nothing to fear from the handover, says research firm IDC's hardware analyst Michael Sager.

"All things considered, they've done all right — as good as one can do given that situation. We haven't seen any big migration in Australia to another vendor because of the change," Sager says.

"Lenovo is coming out right smack in the middle of interesting times in Australia. Broadband is at a critical mass, we've got dual-core processing, Vista is coming out later in the year and you've got the merging of CE and IT markets. The other vendors have their place in the market and it's very hard to move. Lenovo gets to do everything from scratch."

Lenovo is trying to convey a message of continuity to customers and is happy to stretch out the transition phase, says Lenovo chief marketing officer Deepak Advani.

"All the reasons why you bought ThinkPad and ThinkCentres in the past, they're still true today."

communication, communication, communication," Hortensius says.

"The IBM half of the staff have a lot of experience dealing beyond just one country, such as working across time zones and in different languages. In Lenovo we use a lot of internet tools to help us easily exchange information, along with video conferencing."

Lenovo had no Australian employees, so the country's former IBM PC division became Lenovo's new Asia Pacific headquarters (without the need for job losses), says Alan Munro — now Lenovo's Australian and New Zealand general manager.

"The overlap in both the country coverage and the products we made were pretty small, so it was a good fit," Munro says.

The new Lenovo is doing its best to reassure IBM customers that it's business as usual. The back-

end deal with IBM has allayed concerns over service and support, but the wild card in the deal is that Lenovo is now responsible for designing future ThinkPad and ThinkCentre products. For most computer vendors, this is a task usually undertaken in the West or perhaps Japan, with Chinese manufacturers left to join the dots.

Putting the Chinese at the helm of the Think range, rather than just in the engine room, raised some eyebrows amongst customers. Lenovo acted quickly to reassure them it wasn't going to let the former IBM flagship products stagnate. Soon after the deal went through, Lenovo established a US\$2 million Innovation Centre at Research Triangle Park, near the main campuses of the University of North Carolina. Lenovo also moved its headquarters to the US, with operational headquarters in North Carolina, while its CEO and chairman are based in Singapore and New York respectively.

China's design capability is "one of its best-kept secrets," says Lenovo

chief marketing officer Deepak Advani.

"There is a big shift of companies that are going from manufactured-in-China to designed-in-China. I'm pretty convinced that, over the next couple of years, the perception people have of China will evolve from where it is today, to one of companies that not only offer efficiency but also innovation," Advani says.

"I think you'll see a number of companies — that have roots in China — will start to go global and have design as one of the key differentiators."

Lenovo is one of China's largest PC providers and has just released in Australia its first Lenovo-branded computers (see Lenovo 3000 range, above left). They are aimed primarily at small business users, rather than competing with the high-end IBM-branded Think range.

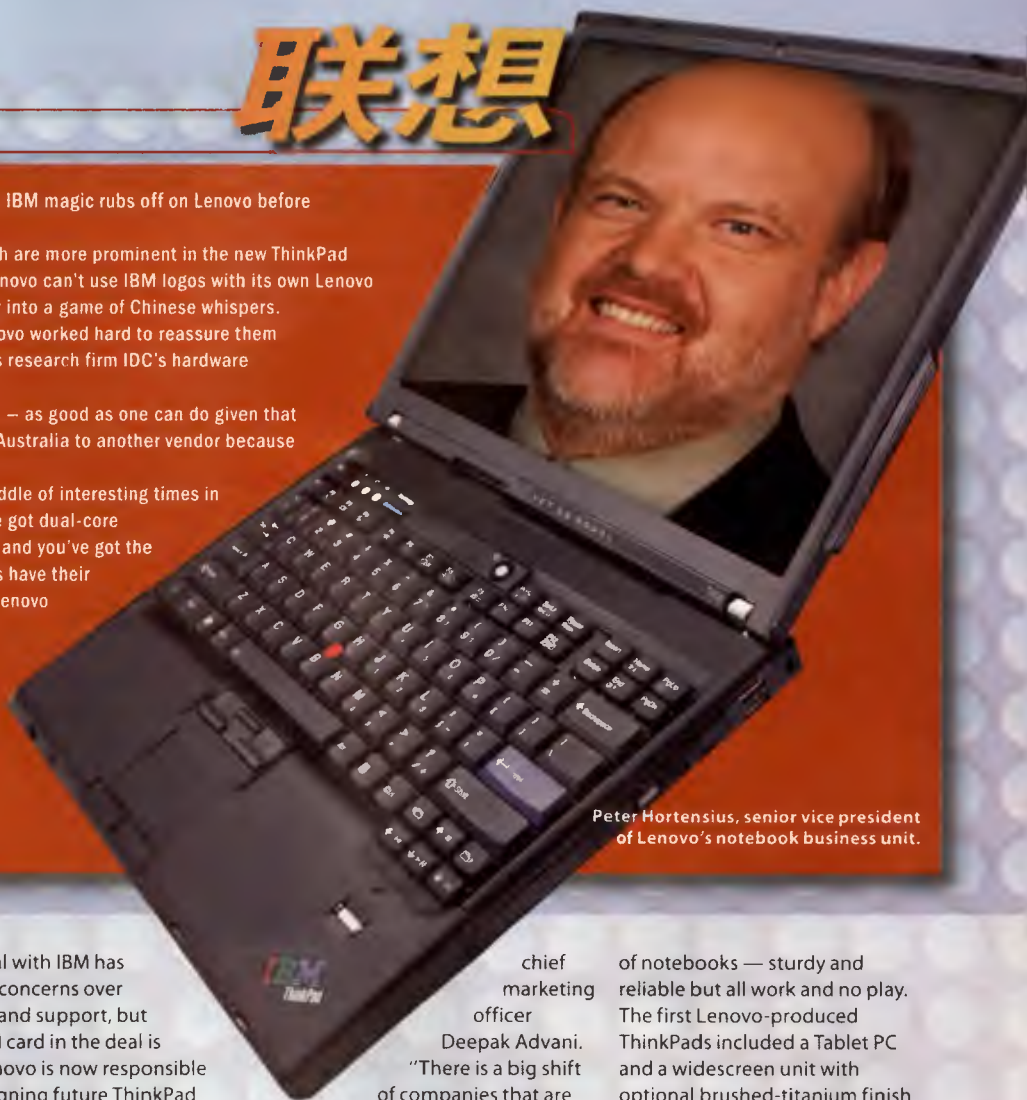
The ThinkPad has also undergone a makeover. The all-black ThinkPad has long been considered the Volvo

of notebooks — sturdy and reliable but all work and no play. The first Lenovo-produced ThinkPads included a Tablet PC and a widescreen unit with optional brushed-titanium finish. At the same time, the ThinkPad is also embracing new technologies such as dual-core processing and 3G high-speed wireless connectivity. The new ThinkPads have debuted to positive reviews.

The decision to introduce some luxury features into the workman-like ThinkPad was not taken lightly, Advani says.

"Some of the market research said it's a departure from the traditional ThinkPad mould, so you shouldn't do this right now because a lot of customers are concerned about ThinkPads not being ThinkPads any more," he says.

"We decided to go forward with it because we were convinced we were still staying true to the ThinkPad brand essence. ThinkPad has always stood for the ultimate business tool and we're still keeping the level of quality and innovation — but we are now going to accelerate it." **THIS**



Peter Hortensius, senior vice president of Lenovo's notebook business unit.



Champing at the BitTorrent

Only a few years ago, BitTorrent was just another emerging peer-to-peer (P2P) technology. Today, it dominates the field. *Peter Sbarski* explains how BitTorrent actually works.

BitTorrent is widely used. How widely? According to an analysis by British firm CacheLogic, BitTorrent was responsible for 30 per cent of all internet traffic in 2004 (P2P overall was responsible for 60 per cent).

Today, BitTorrent alone surpasses email and HTTP in terms of data transmitted over the internet. BitTorrent is successful for a reason. Like eDonkey, it changed the paradigm for distributing large amounts of data — and did so in an open and creative manner.

THE POWER OF A GOOD IDEA

Bram Cohen was in his mid-twenties when he started working on BitTorrent. His idea was thoughtful and inventive: take a file (or a collection of multiple files) and break it into smaller parts — say, about 256KB or 512KB each — then allow other users (peers) to download these chunks and share them around.

This idea may not seem like much but consider the following. We are used to downloading files directly off a server. Each user downloading a file takes away a bit of the server's bandwidth. And, if there are too many connections and too many downloads then... well, I am sure you know what usually happens.

With BitTorrent, however, everything is quite the opposite: the more peers the better. This is because peers can download file chunks off other peers. This is akin to downloading from multiple servers at the same time. Peers also only need to have a few parts before they can begin to share. So it is in everyone's best interest for more users to download, share file parts and, as a result, achieve a higher throughput.

You may have noticed a catch in the above description. If peers only download and never upload (those who do this are called leechers), then the idea becomes untenable. Peers have to actively share their files with others. The cooperative nature of the idea demands this. The BitTorrent protocol, thankfully, is quite smart.

If it detects that certain chunks are rare, it tries to download them first. It can download chunks in any order and then put the file together. Once a peer has finished downloading the file, they become known as a seeder. A seeder does nothing but upload the file to other peers. Seeders are very useful because they have all the required parts (there is always at least one seeder to begin with). If there aren't any seeders around it is harder — but sometimes still possible — for peers to finish downloading their files. For this to work though, all necessary chunks have to be available among all peers (a distributed copy). If you use BitTorrent, please seed your files a little. It is simply a nice thing to do.

File corruption should be familiar to anyone who has ever tried to download a file over HTTP or FTP. With BitTorrent, file corruption never happens. As each part is downloaded it is hashed. This hash is then verified against the block hash stored in the .torrent file (more about this file below). If there is a mismatch, the part is downloaded again. Therefore, unless the shared file was corrupt to begin with, it always comes out alright.

SHARING AND TRACKING AMONG FRIENDS

Linux users were early BitTorrent adopters. They used it to share Linux distros which typically run into hundreds of megabytes. The actual process of sharing files was so easy and effective that BitTorrent grew beyond that community.

To share a file, one needs to create an accompanying .torrent metainfo file. This file uses a storage format called bencoding. In this format, data

is kept as a set of dictionaries and lists. When a .torrent file is generated it creates a dictionary structure called *info*. In case of a single file (single-file mode), this dictionary stores the following data:

- Length of the file in bytes.
- A 32-character MD5 hash of the file (optional, not used by some clients).
- The name of the file.
- The length, in bytes, of part pieces.
- The SHA1 hash of all pieces concatenated in a single string.

The screenshot shows the BitComet interface. On the left is a sidebar with navigation options like 'All Files', 'Search', 'Peers', etc. The main window displays details for a torrent named 'Star Trek: Voyager'. It shows the torrent's progress, including 'Downloaded' and 'Uploaded' amounts, and a list of connected peers. The bottom section shows a detailed list of peers with columns for IP, port, upload/download rates, and status.

BitComet displaying useful torrent, tracker and status information.

This screenshot shows a detailed view of the 'Peers' list in BitComet. It displays a table of connected peers with columns for IP address, port, upload/download rates, and status. The table is sorted by download rate, showing various peers from different locations and their current activity.

BitComet showing currently connected peers.

When there are multiple files (multi-file mode), the *info* dictionary stores path and length information for each of the files. It also saves the name of the top-level directory. Finally, every *.torrent* file also records the following:

- The URL of the tracker (called "announce" in BitTorrent jargon).
- URLs of backup trackers (optional).
- And creation date, comment and "created by" entries (also optional).

Most, if not all, BitTorrent software clients can generate a *.torrent* file. The user only needs to specify the tracker and the file. To download, you need to get the appropriate *.torrent* file, open it in your client software and specify where you want files to be saved.

TRACKING

The *.torrent* file keeps the address of the tracker — which is a special server that keeps track of all peers downloading and seeding the file. When a peer needs a new chunk, it quizzes the tracker to find out which peers have it. The tracker looks into it and sends back a bunch of addresses. The peer then tries to establish a direct connection with these addresses, acquire the required parts and upload if necessary.

When a client needs to retrieve peer information, it sends a GET request to *announce* itself to the tracker with the following data:



IF YOU USE BITTORRENT, PLEASE SEED YOUR FILES A LITTLE. IT IS SIMPLY A NICE THING TO DO

- *info_hash*: SHA1 hash of the bencoded *info* dictionary contained in the *.torrent* file.
 - *peer_id*: a string of 20 characters identifying the peer.
 - *ip*: the internet protocol address.
 - *port*: the port number used.
 - *uploaded*: the amount of data uploaded thus far.
 - *downloaded*: the amount of data downloaded thus far.
 - *left*: the amount of bytes the peer still has to download.
 - *event*: optional parameters which specify the status of the download.
 - *numwant*: the amount of peer addresses the tracker should return in its reply (default is fifty).
- The tracker notes this information and prepares a response. This response is usually made up of the following information:
- *interval*: the seconds the peer should wait between re-requests.
 - *peers*: the tracker returns information about the peers which have the required parts (this information consists of the *peer_id*, ip address and port number).
 - *peers_ipv6*: this is optional and only used if the client requested a

compact response and peers are using IPv6 addresses.

The tracker can also send a *failure reason* key in its reply. This happens when the tracker can't process the client's request. Trackers can usually supervise multiple downloads of multiple files at the same time. However, they are considered a weak point in BitTorrent's design. If a tracker goes down, peers immediately lose the ability to find one another and everything grinds to a halt.

LEECHERS vs SEEDERS

Leech resistance describes various techniques in P2P which encourage peers to upload files. Leech-resistance algorithms can penalise users who don't seed, by limiting their speeds or kicking them off the network. In the BitTorrent world, some trackers employ a credit system as a form of leech resistance. If the tracker determines a peer doesn't seed, it can stop or limit its advertising to other peers. Another approach requires users to register before they can acquire and use *.torrent* files. The tracker makes sure that only authorised peers can download and

— if it detects that a registered peer doesn't upload enough — it can ban them completely.

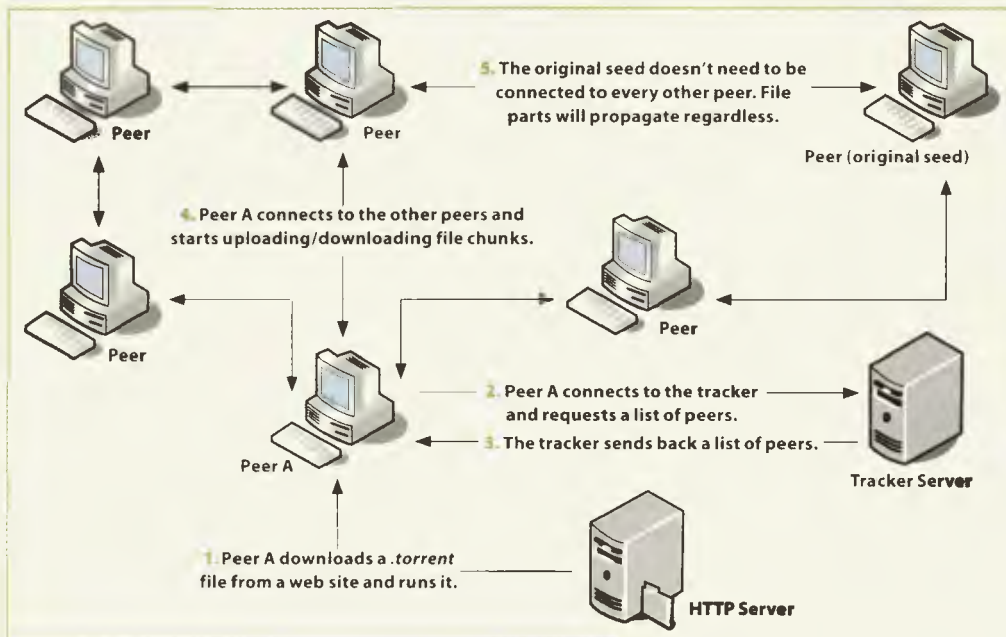
NOT SCI-FI: TRACKLESS TORRENTS AND WHAT THE FUTURE HOLDS

Whereas before BitTorrent, users had to rely on static, dedicated trackers to find other peers, now a new approach does away with this. The new approach, based on the idea of Distributed Hash Tables (DHT), enables every peer to become a tracker. In DHT, each client stores a bit of routing information and is responsible for some of the routing of other peers. Azureus, a Java-based BitTorrent client, was one of the first to introduce and support a DHT layer. Unfortunately, Azureus' DHT is not compatible with the official BitTorrent DHT specification. Software clients such as BitComet and BitSpirit support the official forms of DHT. Trackless BitTorrent is the next step to a completely decentralised, anonymous and encrypted P2P network.

Microsoft says that its new P2P system — called Avalanche — will best BitTorrent. Bram Cohen disagrees, and the evolution continues. [MORE](#)

INSIDE INFO

- The BitTorrent protocol www.bittorrent.com/protocol.html
- More detailed BitTorrent protocol specification <http://wiki.theory.org/BitTorrentSpecification>
- Official BitTorrent FAQ www.bittorrent.com/FAQ.html
- BitTorrent tracker protocol <http://wiki.theory.org/BitTorrentTrackerProtocol>
- BitTorrent on Wikipedia <http://en.wikipedia.org/wiki/BitTorrent>
- Microsoft's Avalanche <http://research.microsoft.com/~pablo/avalanche.aspx>
- BitTorrent comparison http://en.wikipedia.org/wiki/Comparison_of_BitTorrent_software



Peer pressure: a small network diagram of a BitTorrent P2P network.

apcexpl

They might look tiny, but when you first hear Bose's Jewel Cube speakers you refuse to believe they can produce such big, clear sound. Intrigued, APC took the technology apart with a Dremel tool to find out what makes them so effective.

1 Top view of Jewel Cube with case removed showing the "Nautilus" wound port. While a port can be used to extend the bass in a speaker, it's hard to do in smaller speakers, which makes them lack fullness and seem incomplete. The patented wound port enables the Jewel Cube speakers to reproduce a wider range of frequencies.

2 Protective speaker grille.

3 5.1cm Jewel Cube transducer. The cone's small size reduces distortion — it is less susceptible to irregular flexing motion when vibrations occur as it reproduces high frequencies.

4 Top Jewel Cube enclosure, showing exit of the nautilus port.

5 Acoustic foam baffle, separating upper and lower enclosures; semi-permeable foam helps to dampen certain frequencies and to maintain correct frequency response.

6 H-ring, which separates the two cases.

7 Snap ring, which holds the two cases together and enables it to swirl at a 90-degree angle.

8 Bottom Jewel Cube enclosure.

9 Acoustic foam that damps the factor of frequency response.

10 Neodymium iron boron magnet (in basket), which has ten times the energy density of conventional speaker magnets.

11 1in-diameter voice coil (significantly wider than voice coils used in mid- to high-frequency range speakers). The larger voice coil allows the transducer to withstand much higher power ratings, enabling the speaker to reach a much wider range of frequencies (than would otherwise be obtainable from such a small speaker) and allows a more even distribution of force, ensuring a uniform cone motion at higher frequencies.

12 5.1cm speaker cone (and dust cap), which vibrates, moving air molecules (which vibrate a listener's eardrum). The coil is attached to the front of the cone, enabling the entire transducer to be smaller — without sacrificing frequency response. The smaller diameter of the speaker cone makes the transducer less susceptible to distortion caused by irregular movement, which is a problem in larger speakers at higher frequencies.

13 Surrounding O-ring, to hold the cone.

14 Protective speaker grille.



Shown here at actual size of 82mm x 55mm.

To the ear, the sound of a smaller speaker can lack fullness and seem incomplete. A port can be used to extend the bass in a speaker, but its size requirements make it difficult to use in smaller speakers. By using a patented wound port, the Jewel Cube speakers can reproduce a wider range of frequencies (from a cabinet no bigger than an espresso cup).



Building tech



Note: Bose's Jewel Cube speakers are part of the Bose Lifestyle 48 DVD home entertainment system.



Ruby on Rails 101



Ruby on Rails is an open source web-app framework that's taking web development by storm. *Tim Buchalka* explains why developers should think about training up in it.

TIM BUCHALKA

Tim Buchalka is a software developer with over twenty years' experience in numerous computer languages. Since 1998, he has focused primarily on web-app development. Tim operates a software development company, Intrinsic Services, in Adelaide, Australia, currently working on several major web apps for release in 2006.



SKILL LEVEL

- Web developer

If you're into web development, chances are you've heard of Ruby on Rails. Also known as Rails and RoR, it's an open source web-application framework originally developed by David Heinemeier Hansson as part of a web-based project management tool called Basecamp (see <http://basecampHQ.com>).

David extracted the best parts of the underlying framework from Basecamp and released it to the public as Rails in July 2004. Since then, the already impressive framework has been enhanced by literally hundreds of open source contributors, culminating in the version 1.0 release in December 2005.

Rails has to be one of the most revolutionary, powerful and easy-to-use web-application frameworks to be released in years. And it's fun to use. Fun is probably not a good reason to list when trying to convince your boss to use it at work, yet that's exactly what it is! Everything you need is built in, simple to use, elegant and well, frankly

— just works. There is no need to find additional libraries and packages; just install Rails and start coding.

Rails is designed around the Model View Controller (MVC) architecture — often a standard for web-app frameworks — and boasts an impressive feature set including Ajax and CSS support, integrated web services, code generators, an inbuilt unit-testing framework and more.

Rails itself was written in Ruby, a programming language developed in Japan by Yukihiro Matsumoto over a decade ago. Ruby is a fully object-oriented language, perfectly suited to web development. Until recent times, lack of English documentation has slowed the uptake of Ruby in other countries. But now that this documentation is readily available (together with the release of Rails), Ruby has become a popular mainstay throughout the world.

Some of the key reasons Ruby on Rails has created enormous interest in the web development community include:

1. TIME SAVINGS — a typical web application can often be developed six to ten times faster than in traditional frameworks using languages such as Java — without any reduction in quality. But don't just take my word for it, download the code from the official web site (www.rubyonrails.org) and try it out for yourself.

2. CODE GENERATORS

— Rails can generate Ruby code automatically. "Scaffold code", as it is referred to in Rails, is a quick way to get the basic CRUD (Create, Replace, Update and Delete) functionality for maintenance screens working in record time. Need to add a

new field to the database? One quick command and the screens are regenerated simply with no fuss. Additionally, there are third party code generators available to automate other functions of a web application, and it's relatively easy to write your own templates once you get the hang of the environment.

3. DRY (Don't Repeat Yourself)

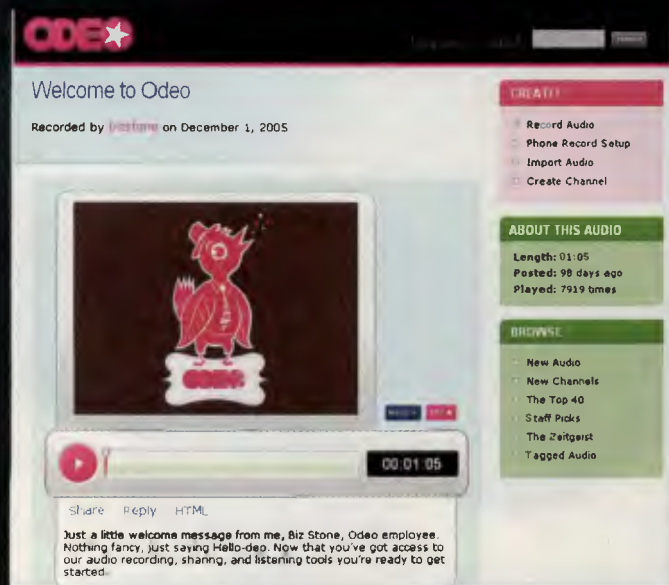
— this is one of the key mantras of Rails. A piece of information should be expressed once only in an application. For example, in other web-app frameworks, adding a field to a database might entail editing numerous source code files, database definitions and front-end HTML files. Rails allows editing in one place only, with the other parts of the application finding out about the changes automatically or when the code is regenerated — all with a minimum of effort from the developer.

4. CONVENTION OVER

CONFIGURATION — another of Rail's mantras (and an end to complex XML configuration files). Rails has sensible defaults for most of its internal settings and will automatically handle the "low-level" information that typically needs to be defined in other web-application frameworks. For example, Rails will automatically map database tables to Ruby objects. Whilst it is certainly possible to do this in other frameworks (albeit by combining multiple packages to achieve it), few frameworks are as fully featured and integrated as Rails.

5. SIMPLICITY — partly because of the above mantras and partly due to the elegance of Ruby, Rails is quick and easy to learn and use. Complex requirements can

Odeo is a sound studio delivered via your browser.



Basecamp lets you track important project milestones and note who is responsible for each one.

now be met with dramatically less code than other frameworks and languages, offering the obvious benefit of making the application easier to develop and maintain.

6. MVC — Rails adheres to the standard Model View Controller (MVC) architecture, commonly used in many other web-application frameworks. MVC separates functionality of an application into three distinct sections, making it easier to maintain whilst reducing dependencies on other sections.

In Rails terminology, the Model consists of objects that map directly to database structures (the domain model). Developers generally need only to write code to communicate with these classes and Rails will figure out the rest. This is dramatically different from other web-application frameworks that often require an extensive knowledge of SQL.

The View section of an MVC web-app framework displays the data generated from the Controller section. In Rails, this is achieved using a combination of HTML code and Ruby code — very similar to Java Server Pages (JSP) or Active Server Pages (ASP). Additionally, there are template systems available to enable HTML and XML to

be constructed on the fly by a program you develop (if you do not want to do it yourself).

Cascading Style Sheets (CSS) are supported, making it easy to create clean, professional-looking and easy-to-maintain web pages. Rails also provides helper functions to other front-end technology, including the much-hyped Asynchronous JavaScript and XML (Ajax).

Ajax allows web applications to be far more interactive, almost to the point of looking



and functioning like a standard installed application on a user's computer. Ajax achieves this by exchanging data from the web page to the server without the traditional page reload usually required by web pages.

Gmail is a good example of a web-app using Ajax. Campfire (www.campfirenow.com) is an example of a Ruby on Rails application utilising Ajax to create a highly interactive web-based group chat app.

Lastly, the Controller section of an MVC web-application framework provides "control"

In Basecamp, the Dashboard lets the user see all your clients and projects on one screen. Each project name links to that project's extranet site.

of the application, enabling the means for the View and Model sections to communicate with each other.

The fact that Rails has been designed from the ground up to fully embrace MVC is one of its core strengths — and a feature that is often lacking in other web-application frameworks. For example, to fully embrace MVC with the features found in Rails, a Java developer might need to learn and use a number of separate products

and be able to bid on larger projects that ordinarily would have been beyond their capabilities (and normally only open to large web development companies).

Versions of Rails are already available for Windows, Linux and Macintosh. The application itself can run with Apache (the internet's most popular web server) or other web servers, and is also supplied with WEBrick, the pure Ruby web server that is part of Ruby.

ONE OF THE MOST REVOLUTIONARY, POWERFUL AND EASY-TO-USE WEB-APPLICATION FRAMEWORKS TO BE RELEASED IN YEARS

— such as Struts, Hibernate and Tiles — which have not been designed from the ground up to be compatible with each other.

Ultimately this leads to increased complexity and dependencies — and often, increased development time frames trying to get all these products to work together.

Because development times can often be dramatically reduced in Rails, whole groups of small-scale development teams (and even one-man-bands) will potentially have access to much larger markets

More and more web host providers are offering support for Rails applications to be deployed on their machines.

Database support already includes MySQL, PostgreSQL, SQLite, Oracle, SQL Server, DB2 and Firebird — and this list will grow over time.

Also, a number of books have been released about Rails. One of the best releases being *Agile Web Development with Rails* by the Pragmatic Programmers — see <http://pragmaticprogrammer.com/titles/rails/index.html>.



To sync or to swim?

Keeping all your personal information and data constantly up-to-date across several computers can be a hassle. *James Bannan* looks at a Microsoft tool designed to take the pain away.

JAMES BANNAN

James Bannan moved to Australia from England in 1982, but remains a stubborn Yorkshireman to the core. He graduated from Melbourne University with a BA/BCom in 1999 and went straight into IT. James worked as a support consultant at PricewaterhouseCoopers for over three years before moving to St Leonard's College as a systems manager. Outside of work, James is a competitive ballroom dancer.



SKILL LEVEL

● Beginner

TIME TO COMPLETE

● One hour

REQUIREMENTS

● Two folders to be synchronised; Microsoft SyncToy.

Most of us now are in a situation where we have data at our workplaces and data at home. Or to be more precise, we have a pool of data which we need to access at two physically separate networks — the challenge is keeping this data consistent. One solution to date has been external drives. Personally, I carry quite a lot of personal data on a portable 2.5in drive, but then I have the problem that unless I manually copy it somewhere safe, it never gets backed up. And as we all know, if a backup doesn't occur automatically, it simply doesn't happen.

A better idea is to have your data transported by whatever means appropriate, like an external drive or laptop; but then — at each location — have it update to a static area accessible from that network like a file server. Apart from the benefits of convenience, there's the added benefit that you are introducing multiple data safeguards — if one source dies there's another one waiting in the wings (and it's 100% up-to-date).

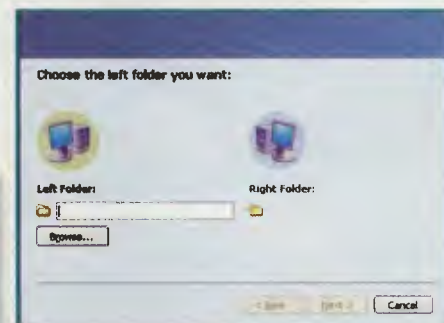
I HAVE THE POWER...

The problem is that data consistency is one of Windows' major weak points. There just aren't any tools native to Windows to help you in this situation, so we need to look for add-ons to

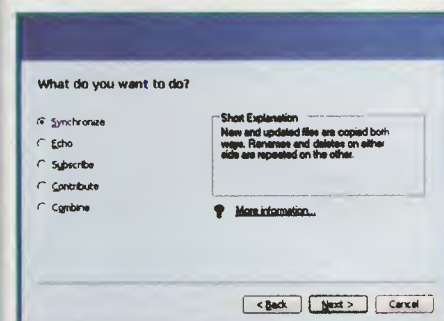
get the job done. To their credit, Microsoft recognised this problem and released an application in the suite of PowerToys for Windows XP called SyncToy.

SyncToy is available as a free download from www.microsoft.com/windowsxp/using/digitalphotography/prophoto/syncToy.msp. It only works on Windows XP and requires the .NET Framework 1.1 to be installed (it won't recognise .NET Framework 2.0).

Once you've installed it, SyncToy will prompt you to set up your first folder pair. Instead of specifying a source folder and a target folder, SyncToy uses the concept of left and right folders. It's the same idea really, but it does have some significance depending on the synchronisation method you use. SyncToy can use any folder which Windows can use — local drives, mapped network drives and UNC paths. If you specify a drive which is actually a portable device, make sure it's connected properly before running



Define the left and right folders for the pair.



The wizard gives a brief explanation of each sync method.



Create the first folder pair from the SyncToy GUI.

the job. SyncToy isn't adaptive enough to know what lies at the other end of a drive letter.

Now that you've got your source folder A and target folder B, let's see how each synchronisation method works:

1. Synchronise

- Every new or modified file in folder A is created or modified in folder B, and vice versa.
- Every file which has been renamed in folder A is renamed in folder B, and vice versa.
- Every file deleted from folder A is deleted in folder B, and vice versa.

2. Echo

- All changes made in folder A are applied to folder B — new files, renamed files and deleted files.

3. Subscribe

- Folder B is viewed as a repository of constantly updating information which users subscribe to, thus receiving updates.
- Changes in folder B are made to folder A — new files and renamed files.
- No files are deleted.

4. Contribute

- Folder B is viewed as a data repository to which users contribute.
- Changes in folder A are made to folder B — new files and renamed files.
- No files are deleted.

5. Combine

- Combine ensures that all files exist in both locations.
- New and modified files in folder A are created/updated in folder B, and vice versa.
- No files are deleted.
- Renamed files are not copied.

So essentially, Synchronise is a true synchronisation process; Echo is basically mirroring one folder to another; Subscribe and Contribute offer a receive data/supply data relationship to a fixed point; and Combine is basically Synchronise without the rename or delete functions.

One of the interesting features of SyncToy (which can actually end up more of an irritation) is that it *only* works with files. Folders are pretty much ignored, except in the context of their contents. For example, if you create a folder with no files in it, SyncToy will completely ignore it. Likewise, if you erase a folder, SyncToy will erase all the contents of that folder at the remote location — but will leave you with an empty folder. This means that you always need to keep an eye on things, otherwise you'll end up with redundant folders all over the place.

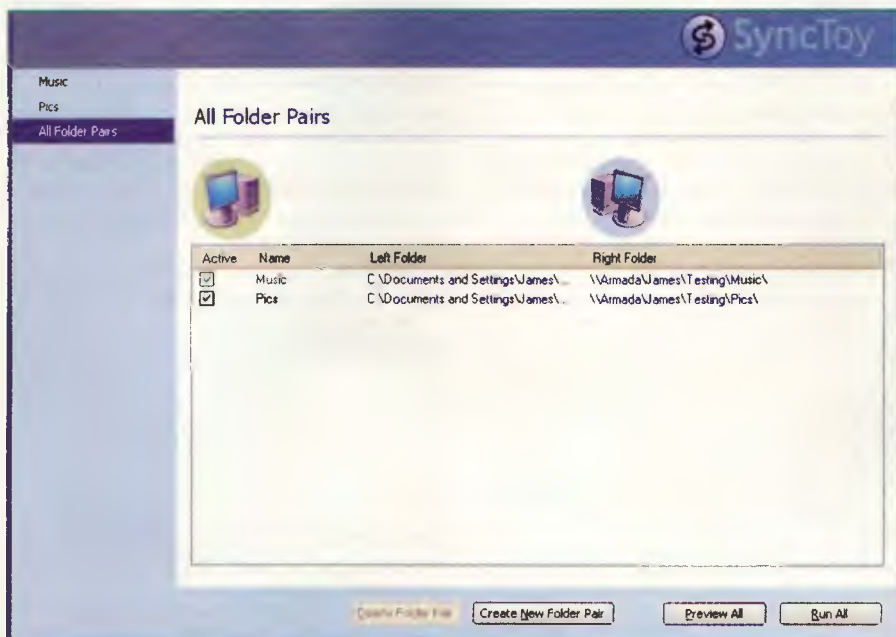
THE PERSONAL TOUCH

Each folder pair can be customised to suit your needs — highlight the pair and select Change Options. By default, the Files To Include option is set to examine every file type in the folder pair, but you can modify this to only interact with specific types. For example, if the files in My Music are all MP3s, then it makes sense to change the file type to reflect this. It also ensures that if any other files get into the folder, that they are ignored. The field accepts

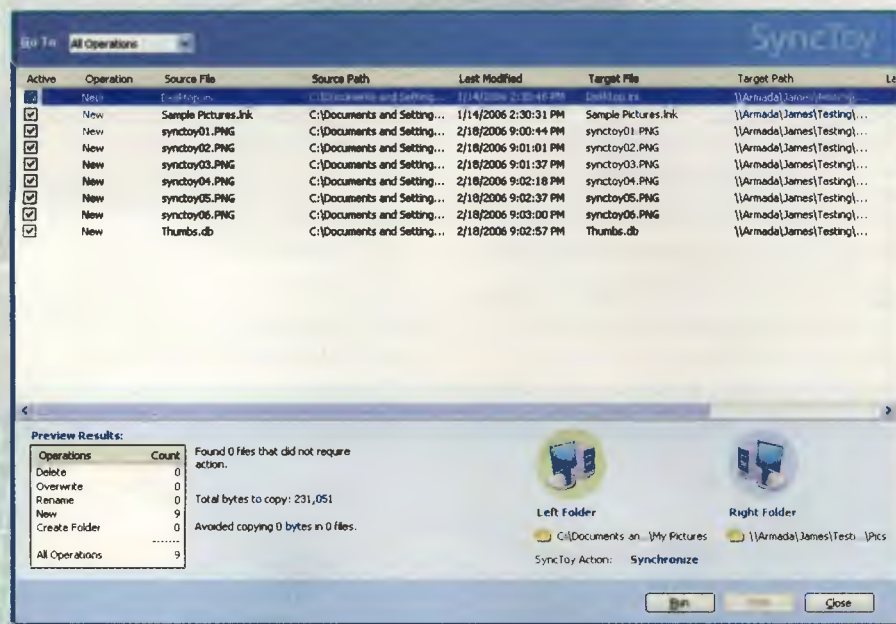
standard Windows file-type syntax, so you can add multiple types separated by a semicolon (eg. *.mp3; *.wav) or more detailed filters using wildcards (eg. work*.doc; *_budget.xls). "Check file contents" is off by default. When enabled, SyncToy performs an SHA1 hash check against all the files covered by the folder pair. It assigns a unique value for each file and ensures that there are no accidental deletions or overwrites, in the situation that two files exist with the same name and time/date



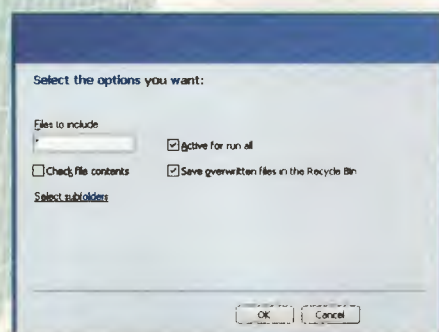
Modify and customise each folder pair.



The All Folder Pairs view gives extra options.



The preview gives a detailed rundown of the sync job.



Change the file filter to customise content.

stamp. The job will run slower with this option enabled, but it does buy peace of mind.

"Select subfolders" gives you the option to remove particular subfolders from the sync process and their contents won't be examined. By default, every subfolder is synchronised and all new subfolders are automatically included.

The Active for Run All checkbox is on by default, which means that the folder pairing job is run when the Run All task is selected. Unticking means that the job must be run manually. And finally, Save overwritten files in the Recycle Bin ensures that files which are overwritten — due to the source file being modified — are put into the Recycle Bin first. This is useful as a level of just-in-case data protection. If you turn this option off, modified files are simply overwritten. Deleted files are always sent to the Recycle Bin — this behaviour can't be changed.

If you've created a folder pair and then decide that the chosen action isn't appropriate, just highlight the pair and click Change action; this will bring up the list of actions — just choose the one you need.



KEEP AN EYE ON THINGS, OR YOU'LL END UP WITH REDUNDANT FOLDERS ALL OVER THE PLACE

GETTING TO GRIPS

Once you've created a folder pair (or multiple) and performed all necessary configurations, running the pair is as simple as highlighting it and hitting the Run button. To see what the job will actually do without committing to it, choose the Preview option. This will give you a readout of what changes will be made, and you can actually turn off any of the proposed actions before submitting the job. As previously mentioned, all the jobs can be run from the All Folder Pairs window — you can untick particular jobs to exclude them from the Run All task — but this is not the same as unticking the Active for Run All option. When you go back to the All Folder Pairs window, the job will be active once more — it's just a one-off setting.

Deleting a folder pair does nothing to the content — it just removes the job from SyncToy.

There is a 260-character limitation on the combined folder paths specified in a folder pair. This can be a problem if you need to sync a folder that's buried deep in a complex folder hierarchy. To get around this you can create a drive-mapping which maps directly to the folder you wish to sync. Right-click on My Computer or My Network Places and select Map Network Drive. Assign an unused drive letter and browse for the exact folder you want to use in the folder pair. Create the mapping and then you can simply use the drive letter in the sync job — much easier. Of course, there's not much point in having a tool like this unless you

can make it work behind the scenes. Unfortunately, SyncToy doesn't offer any sort of scheduling option, so unless you have a preferred third-party tool, you'll need to use the Scheduled Tasks function within Windows.

Go to Start > All Programs > Accessories > System Tools and choose Scheduled Tasks. If the add-task wizard doesn't start automatically, double-click Add Scheduled Task. If SyncToy doesn't appear in the application list, browse for the executable (C:\Program Files\Microsoft\SyncToy\SyncToy.exe). Enter an appropriate name for the new task (bear in mind that you can create tasks for individual sync jobs, so choose a descriptive name). The schedules available in this tool aren't great, but for the moment let's assume that you want to run it during business hours Monday to Friday, so select Weekly. Tick Monday through to the Friday, and set 9:00am as the start time. Enter in your username and password (so that the task has sufficient rights to run), and select to open the advanced properties once the job is created.

If you wish to only run a particular sync job, go to the Task tab and modify the Run field. It should read "C:\Program Files\Microsoft\SyncToy\SyncToy.exe".

Change the entire line to read "C:\Program Files\Microsoft\SyncToy\SyncToy.exe" -R "My Pair". Note that there is a space before the -R, but not one directly after it. Enclose the name of the sync job in quotation marks. Then, go into the Schedule tab and click on the Advanced button. Put a tick in the Repeat Task checkbox and enter in a frequency which suits your needs. Then select the Time radio button next to Until and enter in 5:00pm. Also tick the If the task is running... checkbox. If you're running this task on a laptop — and you want it to run regardless of whether the power cord is plugged in — go to the Settings tab and untick the two ticked options under Power Management.

Click Apply and OK to everything — you've now created a task which will sync your folder pair regularly between 9:00am and 5:00pm Monday to Friday. If there's a reason that the task can't run (you're off sick or away from the office), it will simply fail but won't cause you any grief.

As you can see, SyncToy isn't the most flexible of applications, but it does its job well in leveraging off existing Windows file architecture (and certainly gives you plenty of options for keeping your files consistent). [E.T.C.](#)

Shut the XP up!

How many times have you shut down XP, to find that the machine restarts? Or it takes *forever* to turn off — or it never actually does? **James Bannan** looks at ways to make XP do as it's told.

JAMES BANNAN

James Bannan moved to Australia from England in 1982, but remains a stubborn Yorkshireman to the core. He graduated from Melbourne University with a BA/BCom in 1999 and went straight into IT. James worked as a support consultant at PricewaterhouseCoopers for over three years before moving to St Leonard's College as a systems manager. Outside of work, James is a competitive ballroom dancer.



SKILL LEVEL

● Intermediate

TIME TO COMPLETE

● One hour

REQUIREMENTS

● Computer running Windows XP.

It's one of the most irritating things about XP — all of a sudden, your PC starts taking forever to shut down. It was doing fine yesterday; but today you can spend minutes waiting, with the Windows screen telling you it's saving settings (while nothing appears to be happening). But what's *really* irritating is that this problem is not caused by one thing, but can be the result of a number of factors or a combination of any of them. Troubleshooting shutdown issues is a mixed process of tweaking, upgrading and under-the-hood hunting.

DRIVING ME CRAZY

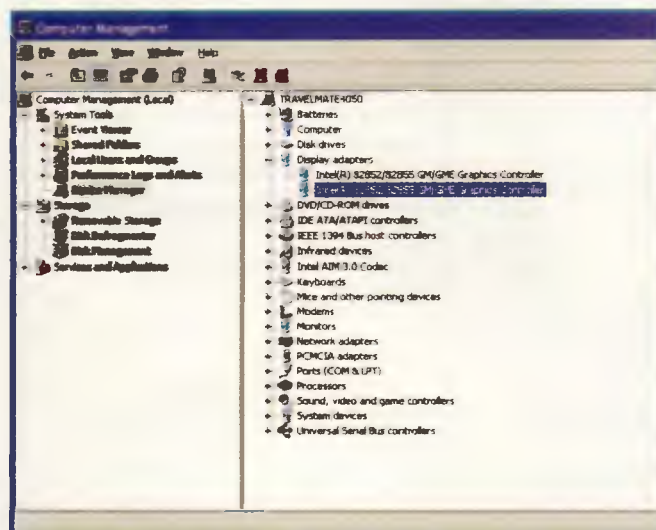
Old, corrupt or otherwise faulty hardware drivers have been known to cause shutdown problems. When Windows attempts to shut down and release all the modules which have hooked into the operating kernel, a faulty driver — which doesn't allow it to do so cleanly — will drag the whole process to a grinding halt. In this situation, XP is rather maligned because it's not actually at fault.

Just because the hardware is working, don't assume that the drivers are. Windows XP has quite a comprehensive driver set, so, if a vendor driver isn't working, Windows can step into the breach and use a Microsoft driver instead. It gets you around the problem of having hardware which doesn't work, but then you're left with a situation where a piece of hardware is controlled by a driver not specifically designed for it (and two drives competing for the same resource, not to mention system files and registry keys).

So, the first thing to do is to audit your drivers. Open up Device Manager (right-click My Computer > Manage > Device Manager). The first thing to check for are those dreaded yellow exclamation marks, as they're a sure indication that something's wrong. If all seems quiet on the Western Front, it's time to look a bit deeper. Firstly, did you have to install third-party drivers to get a piece of hardware working? If so, expand the device and go into the properties of the driver — make sure it's using the driver it ought to be.

What to do if you find a dud driver? Updating drivers depends on how it was installed. If you used a third-party installation application then you should really remove the application rather than just the driver. The reason for this is that driver applications often act as fully-fledged applications, making registry changes, modifying system files, checking remotely for updates and so on. A successful removal can only really be performed using the uninstall script bundled with the application itself. So, use the uninstall option from Add/Remove Programs to completely remove the driver and all linked components. You should also double-check in Program Files and the registry for any remnants which weren't properly removed, as unlinked files and entries can cause just as much trauma as semi-functional ones.

If you didn't use an application to install the driver, then fixing it is much simpler; within Device Manager, don't choose to uninstall the



Is your hardware using the right driver? Check it here.



The Hardware Update Wizard will lead you through a proper driver update.



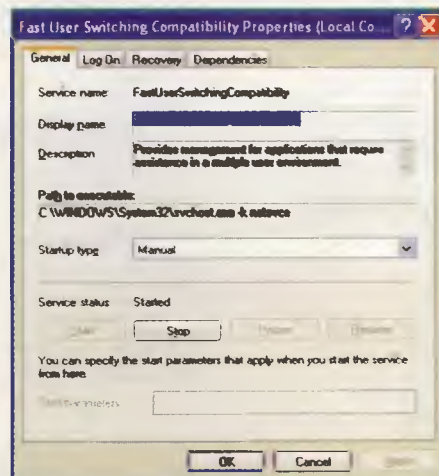
Away with thee: many drivers need to be fully uninstalled.



Captain's log: comprehensive application event logging helps a lot.

good rationale for this — Microsoft doesn't want new users to struggle getting up and running with their new XP-based machine. The downside is there's a lot more happening behind the scenes that isn't strictly necessary, so there's plenty of scope for improvement.

Open up the Services management application (Start > Run > **services.msc**) and cast your eye over all the running services. There are a number that you can probably do without, depending on how you use your computer. For example, do multiple users log on to the machine? If not, stop and disable Fast User Switching and go into User Accounts in the Control Panel and disable the Welcome Screen. That's a major streamline right there. Does the machine have a wireless adaptor? If not, or if it does but you don't use it, disable Wireless Zero Configuration. Do you actually use the Help function, or do you consider it worthless (like everyone who's ever used it)? If so, disable Help and Support. Do you ever use Remote Desktop? Kill the service.



Don't need that app? Disable it!



TROUBLESHOOTING SHUTDOWN ISSUES IS A MIX OF TWEAKING, UPGRADING AND HUNTING

driver — rather, choose to Upgrade. The reason is that uninstalling the driver just disassociates the driver from the hardware, but unless an alternative is found Windows will simply reassociate that driver at the next restart, whereas the upgrade option will overwrite the old driver files, rendering them ineffective. So, select to upgrade and point it to the location of the new driver. If the new driver uses an install application then unfortunately you will need to uninstall the old and use the install rather than make use of the upgrade feature.

To be perfectly honest, if you're experiencing any sort of performance issues with XP, a comprehensive driver update is always a worthwhile task. Drivers are as capable of containing bugs as any other application, and driver releases are as likely to contain bugfixes as they are to feature wider hardware support and better functionality.

SERVE IT UP

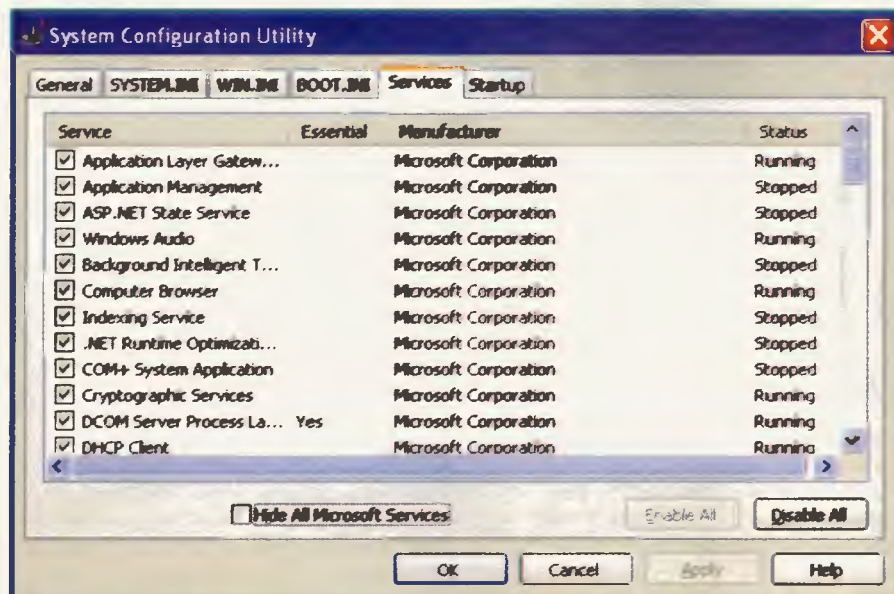
When troubleshooting Windows XP behaviour (or lack thereof), it's vitally important to remember that XP is an NT-based operating system, which means that it's built on services. The old Windows 95/98/ME model, where there was no practical distinction between system application requests and user requests,

led to that precarious experience we all remember with such fondness.

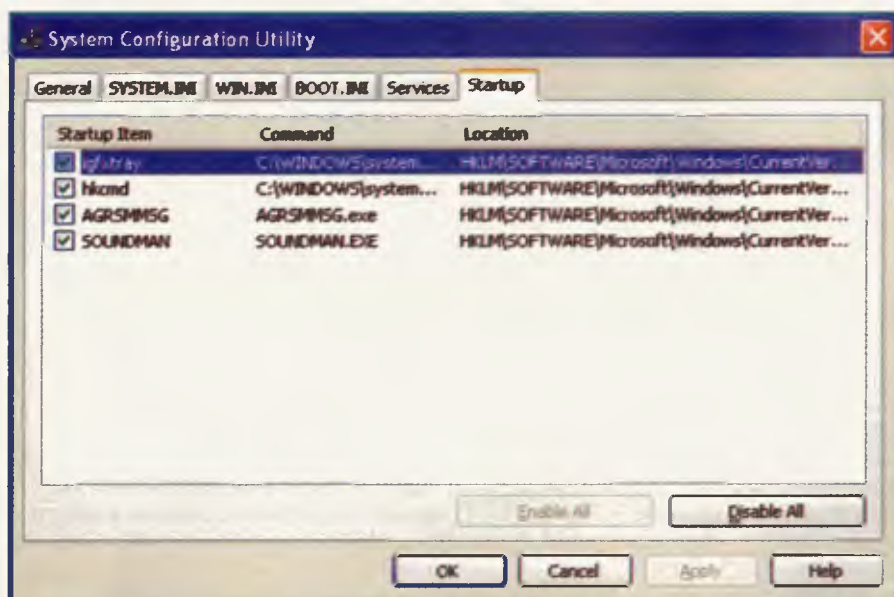
The whole idea of services is that critical system applications run with advanced system privileges and the user is kept at arm's length from the underlying OS. While this has certainly led to greater overall system stability (remember how well Windows 2000 ran?) it also makes troubleshooting instability harder. Services run silently in the background, so they're really out of sight, out of mind.

However, services play a major part in considering what XP does and how it performs. When services load, they are actually calling upon and launching a particular system application into active memory. When XP is told to shut down, it has to unload every single process successfully. It has to do so in an ordered way, because so many services are critically dependent on others. A single point of failure can mean long waits while the subsystem gives the erring service time to terminate, reboots as XP tries to recover from a perceived system failure, or completely hangs when a service just gives up but leaves the other services with nowhere to go.

So, sorting out problems in the shutdown process often means taking a look at what's happening under the hood. Out of the box, Windows enables a *lot* of services. There's a



Self-service: MSCONFIG helps to administer all registered services.



What's happening at startup? MSCONFIG will tell you.

Do you make use of Windows Firewall, Internet Connection Sharing, or any of the Security Centre features? No? There's another two services you can disable.

Unwanted services don't lie solely within Microsoft's domain, however. Many third party applications register themselves as services, mainly because it's a good way to get the job done. An easy way to see which of the installed services are non-Microsoft is to use MSCONFIG (Start > Run > **MSCONFIG**) — go to the Services tab and tick Hide All Microsoft Services. Just because an application you installed has registered a service doesn't mean that it's actually necessary. Nvidia has a Driver Helper service as part of its default

install. ATI has a hotkey-polling service. Do you need them? Unlikely.

This may all sound like basic XP performance tweaking (and it is), but remember that each of these unutilised services are taking up system resources and giving XP more to concentrate on. What's the point of making Windows harder without benefit? No point at all.

THOSE DARNED APPS (AND OTHER GRIEVANCES)

Sometimes we're forced into the realisation that it's neither the drivers nor the services, but something we've installed that's to blame (heaven forbid!). Again, MSCONFIG is your friend here — you can use it to see precisely what is being loaded at startup. Other than services, Windows doesn't

really load much at startup, so pretty much all the applications shown by MSCONFIG will be third party. Drivers generally always load something, so again they need to be examined (back to step one), but plenty of other apps get their foot in the door and start-up monitoring activities, system tray applications, scheduled self-update checks, hooks into other applications and so on. MSCONFIG is exceptionally useful in this instance, because you can simply untick the application entry to disable it, then reboot the computer and see how performance is affected. The benefit is that it prevents the application from running without actually deleting the entry or removing the program. It's the clean, surgical method of troubleshooting individual utilities.

Does your XP machine restart itself when you ask it to shut down? Mine used to, and it drove me nuts. What's happening is that the system is actually having what it interprets as a system failure. This is actually a disaster-recovery method — XP believes that if it suffers a critical failure it should restart itself, which in most cases is desirable behaviour. However, in this instance it makes the underlying problem impossible to diagnose. To get around this, right-click on My Computer and select Properties. Go to the Advanced tab and select Settings under Startup and Recovery. Under System Failure, untick Automatically Restart. Leave the other options ticked. One of those other two options, you may notice, is "Write an event to the system log". Very useful. The system log is to be found back in Computer Management under System Tools > Event Viewer > Application. Windows is remarkably good at logging everything done by particular services and applications, so this is a good place to look for the odd black sheep.

Yellow-exclamation-marked entries are warnings, but are generally of little consequence unless there's a whole pile of them clumped together. Red critical warnings are the ones to look out for. Everything is time and date-stamped, so check to see if errors are appearing at either startup or shutdown. Problems at startup can actually be the cause of shutdown problems, when the failing service or application is not making itself apparent until the end of the session. Each error or warning comes with a particular event ID, which is a very useful starting point for researching the problem online. The odds are very strong that someone somewhere will have encountered the same issue as you.

So, be thorough and persistent. Windows shutdown problems are always caused by something not performing the way it's supposed to, whether the fault is Microsoft or non-Microsoft in nature. The tools to track down what's happening to your computer are readily available, so have a dig around, keep your drivers up-to-date and take charge of your machine! [EETC](#)



Mastering networking, part 10

Even if you're not taking the media centre route, you may still want to hook up your computer and home entertainment gear, says *Stephen Withers*.

STEPHEN WITHERS

Stephen Withers has been writing for APC since its second issue. With a professional background in operations research and IT, he switched to full-time writing and editing in 1990. As much as he enjoys cutting code, he now has insufficient time for anything more complex than scripting. Stephen has been networking computers since the time when an Ethernet card cost more than a PC.



SKILL LEVEL

● Beginner

TIME TO COMPLETE

● One hour

REQUIREMENTS

● (W)LAN, media player and software; other items as discussed.

IN THIS SERIES

- **Part 8 – March '06**
Networked storage and printing.
- **Part 9 – April '06**
Streaming media servers and clients.
- **Part 10 – May '06**
Connecting to home entertainment systems.

Maybe you don't want your computer in the family room — it could be too noisy or too ugly — but you do want to be able to enjoy your collection of digital content on your big screen TV or stereo. Running multiple cables from one room to another is possible, but messy. You also risk signal loss and interference unless the runs are short. We might consider running cables from a soundcard to a stereo — and from a video output to a TV — if the computer was on the other side of a stud wall to the gear, but that's about it.

MEDIA PLAYERS

One of the simplest ways to get content into the family room is to use a media adapter appliance such as D-Link's DSM-320 or Elgato's EyeHome.

These devices are styled to resemble home entertainment gear — EyeHome resembles a small set-top box, while the DSM-320 looks a lot like a slimline DVD player. ❶ The latter's new sibling, the DSM-320RD, does in fact include a DVD player — so you don't need to leave the room to change discs. It also provides SD/MMC/Memory Stick/Memory Stick Pro and Compact Flash slots for digital photos. All three devices are equipped with Ethernet interfaces (plus 802.11g on the D-Link products) and are easy to install.

The host computer makes the contents of one or more folders visible to the device, and a remote control lets the user select the desired item from menus displayed on the TV screen. The host then sends (photos) or streams (audio and/or video) across the network to the device, which feeds it into a TV and/or audio system. Infra-red remotes let you sit back while you select and control your content.

EyeHome lets you browse the web on your TV and plays internet radio from a list of stations which is extensible by adding the appropriate .PLS files to your Music folder. The DSM-320RD receives Live365.com stations, though free registration is required.

One problem is that none of these devices support the full range of codecs in common use, so you may need to export existing movie files to a different format. They do support MPEG-1, -2 and -4, and the DSM-320RD also handles XviD with MP3 or PCM audio.

I'll outline the installation of the DSM-320RD with D-Link's own Windows software and Elgato's UPnP AV-compatible EyeConnect software for the Mac. It's best to start by installing the software, as the DSM-320RD will look for a server once it's switched on. The D-Link installer auto-runs from the CD. Click the Install D-Link Media Server button, and then click through the usual sequence of installer windows. About the only decision you need to make is at the Select Additional Tasks stage, where you may choose to create desktop or quick-launch icons, or a startup icon — so the software runs automatically on startup. You will need to tell your firewall to allow Media Server to access the network. Media Server automatically checks for new versions of itself, so don't be surprised if your firewall also detects Media Server LiveUpdate. The update process is fully automatic; the software is downloaded, installed and run.

The EyeConnect installer is similarly straightforward, though it does require administrative access. As the notes suggest, you'll need to open port 2170 in the Mac's firewall. Open System Preferences, click on Sharing, select the Firewall tab and then click New. Select Other in the Port Name popup, then enter 2170 as the port number and EyeConnect as the service. Click OK.

❷ The Elgato software honours the standard arrangement of Mac OS X user folders (Movies, Music, Pictures), but additional folders can be shared. Only the iPhoto library is shared from the Pictures folder, so if you want to view images in other subfolders, you'll need to add them to the list.

❸ D-Link's software lets you nominate the folders to be served. In the Shared Folders tab of the D-Link Media Server window, click Add a Folder and navigate to a folder you want to share (eg. My Pictures). Repeat for the remaining folders.

The hardware is about as easy to set up as a DVD player. Run the included AV or S-Video cables to your TV, or use your own cables with the S/PDIF (coax or optical) or component outputs. Attach the wireless antenna or run an Ethernet cable to a spare port on your switch, and plug in the mains lead.

The DSM-320RD runs a setup wizard when you turn it on for the first time. You'll need to select the wired or wireless interface, and if you're going Wi-Fi you must also specify the network SSID, the encryption type and key. If you've installed server software on more than one computer, you'll also need to choose one as the default. Once the settings have been saved, you're in business.

AIRPORT AUDIO STREAMING

❹ If all you want to do is listen to music, and you're happy to use Apple's iTunes as a player, the AirPort

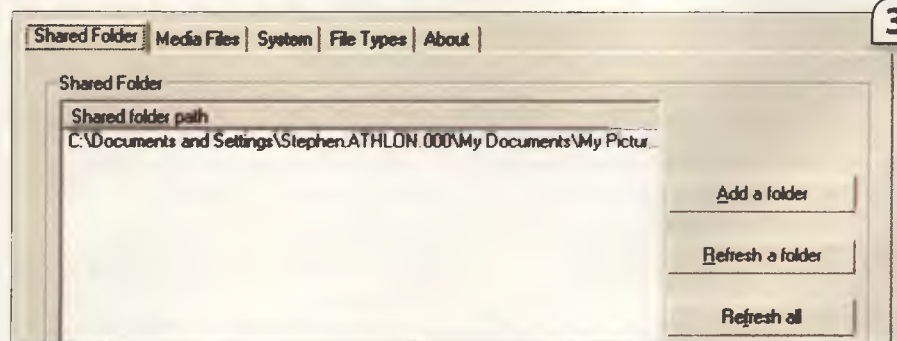
The D-Link DSM-320RD looks like a DVD player... because it is one!



2



Elgato software — arranged like Mac OS X, but shares additional folders of your choice.



D-Link software — lets you choose what to serve and share.

Express does a good job of streaming music to another location via a wired or wireless network.

Once the AirPort Express is set up and your computer has connected to it, using audio streaming is almost a no-brainer.

If you want to connect the AirPort Express to an amplifier or receiver, you have two choices. The more common method is to run a 3.5mm-stereo-plug-to-2xRCA cable between the devices. If your audio gear has a spare Toslink optical input, you may prefer to use a 3.5mm-to-Toslink optical cable, which costs around \$20 (depending on length). The simplest thing is to plug a pair of powered speakers into the AirPort Express.

Once the AirPort Express is connected to some sort of sound gear, launch iTunes version 4.6 or later. You'll see an extra pop-up menu at the bottom right corner, next to the Mixer button. This menu lets you select your computer's speakers ("Computer") or those connected to any particular AirPort Express that you're connected to. Streaming to multiple AirPorts is not supported. The menu uses the name(s) you gave the base station(s). Just pick the speakers you want and play the music. You can even change speakers on the fly, so, if you're taking a coffee break, choose the speakers near the kitchen, and keep listening. There's a pause of a second or two due to buffering, but that's rarely an issue.

The AirPort Express can detect when speakers aren't connected. By default, it only handles audio

from wireless connections; for it to accept streams via its Ethernet interface, you'll need to reconfigure it with the AirPort Admin Utility. In the AirPort tab, click Base Station Options, and then select Enable AirTunes over Ethernet. Click OK, then click Update and wait while the AirPort Express is reconfigured.

Unless you're happy to listen to a set playlist or a random selection, you'll probably want to add the Keyspan Express Remote. The receiver plugs into the AirPort Express's USB port and "talks back" to the computer via the network. A small infra-red remote lets you start, stop, pause, skip and adjust the volume. You can also plug the receiver directly into a computer and use the Express Remote as a general-purpose remote controller with other applications under Windows 98 (or later) or Mac OS 8.6, 9 or X.

Third party software allows audio output from Mac OS X applications other than iTunes (such as Windows Media Player) to be sent to an AirPort Express. Rogue Amoeba's Airfoil routes audio from any application to the speakers (attached to an AirPort Express), optionally duplicating the signal to the computer's own speakers. The software costs US\$25 — a demo, limited to 10 minutes, is available (www.rogueamoeba.com/airfoil/).

AirPort Express and AirPlay both seamlessly stream your music — wired or wireless.

Several other manufacturers have products that receive and play audio streamed across a network from a computer, but at the time of writing the market was in a state of flux. Several older models will have been discontinued by the time you read this — but their replacements were not yet available for testing.

TRANSMITTERS

AV transmitters are widely available and relatively cheap (well under \$100 for generic products). They are commonly used to send DVD or pay TV material to a second set (eg. in the bedroom), but you can also hook the transmitter to the computer's video and sound outputs and put the receiver in the lounge. This is where an extra AV input on your VCR helps, though AV switch boxes are much cheaper than they used to be. These transmitters won't get the best from your TV, let alone a decent home theatre setup, but, depending on the quality of your content, they'll probably be good enough.

If your sound system doesn't have a spare audio input, a short-range radio transmitter such as the Targus FM Transmitter (www.targus.com/AU/, around \$75) plugs into any audio source with a mini-jack output and broadcasts to FM radios within a 10m radius.

Ⓜ If your music is stored on an iPod, you might prefer one of the purpose-built transmitters such as Griffin's iTrip/iFM or XtremeMac's AirPlay/AirPlay2 (prices vary significantly by model and retailer, but around \$80). Both companies have versions for the headphone/remote connector on older iPods and for the dock connector on recent models such as the nano and the video-capable iPod. Such devices are styled to suit the iPod and usually connect directly without cables.

Transmitters are popular for in-car use, but, if you carry an iPod and use a portable hands-free kit with your FM-capable mobile phone, an AirPlay or an iTrip provides a neat alternative to messing around with two sets of earphones. Tune the phone's radio to the transmitter and listen though the handsfree. When a call comes in, the sound will switch automatically to the phone — there's no need to fumble for the iPod. [MORE](#)



5

4



Mastering video, part 2

Before they start shooting, professional video makers spend time getting the capture settings and logging right, writes *Seamus Byrne*.

SEAMUS BYRNE

Seamus Byrne first got his hands on the family Super8 in the early '80s and was hooked. Moving onto video soon after, he made many short films in the backyard, testing the limits of in-camera trick photography. Come the '90s, Seamus was quick to adopt digital editing technology as he moved into professional video direction. Having managed multi-camera shoots with artists including the Foo Fighters and Fatboy Slim, he also regularly works on short film projects for the film festival circuit.



SKILL LEVEL

● Beginner

TIME TO COMPLETE

● 45 minutes

REQUIREMENTS

- Software install files for Avid Free DV or Adobe Premiere Pro. Avid Free DV: www.avid.com/freedv/ Adobe Premiere Pro Trial: www.adobe.com/products/premiere/main.html

IN THIS SERIES

- **Part 1 – April '06**
Defining your settings.
- **Part 2 – May '06**
Capturing and organising source video.
- **Part 3 – June '06**
Editing concepts.

In this Workshop, we'll take some steps toward getting you set for best-practice video capture so you're ready to cut like a real pro.

The particulars of capture are not difficult, but understanding the concepts behind doing it well will make a big difference to the time you spend in the editor's chair.

Let's take a walk through some of the big concepts in capture, before we look at some specifics for our two featured packages.

SHOOTING LOGS

It is a very good idea to keep manual shooting logs as you go. By keeping a list of timecode, shot descriptions and takes, you can save yourself a lot of time. There are always short breaks in shooting that can allow for this work. The more detail the better, but even some basic notes will make a difference when you sit down to capture your footage.

By using your shoot logs, you can be more precise in your capture efforts and utilise timecode in/out point settings to grab exact clips.

LOGGING DURING CAPTURE

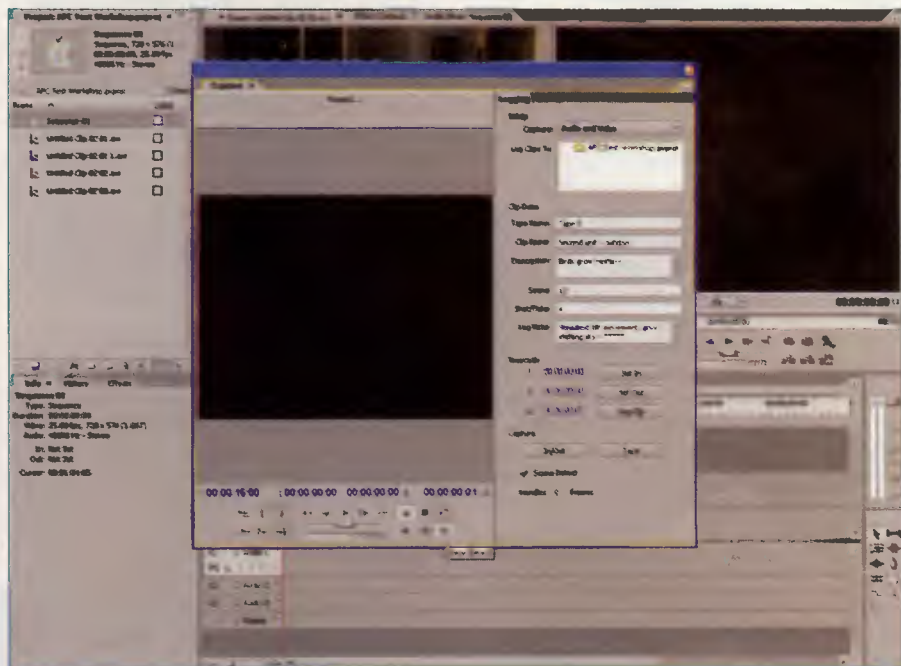
A lot of people like to set their tape to capture while they wander off and do something "more useful", coming back an hour later to check in on how it all went. Doing this wastes your precious drive space and actually leads to more time (spent on naming and splitting your clips after such a big capture)

than if you'd been more careful in the first place. Use the built-in logging system available in your edit software (only basic logging is found in Avid Free DV, but it will still help) to build log notes for your footage during a full tape capture — you'll save more time than that hour you just spent doing something else. This should provide the truest log possible, which can be exported as a log list and used to perform batch-capture operations in many different edit packages — a powerful tool that opens the door to getting quickly into re-editing a film at a later date, should the need arise.

SYNC PROBLEMS

If your tapes are striped, running a start-to-finish import should work out fine. However — you may find you get some problems with the sync of video to audio. If you see a particularly non-uniform sync issue that gets worse at a particular end of a clip (and you can't trace it back to a problem in the timeline), then you might want to recapture the footage and stop the capture before it runs to the end.

Most software now stops this kind of thing from happening, but it's best to check your captured footage right through sooner rather than later, as a recapture could take a lot of work to get back in its rightful place on the timeline. This is also another plus for doing some live logging during the capture process.



Easy does it: with an integrated viewer, Premiere Pro makes the capture quite a straightforward experience.

PRE-ROLL, OFFSET AND DELAY

You can usually leave these capture settings alone, but these settings play a role if you want to perform a final edit directly from source rather than from your captured footage (known as an offline edit). Pre-roll indicates how far in seconds — before the start of a clip — the deck should be shifted to ensure full roll speed is achieved at the correct timecode entry point. Timecode offset can help you match up sets of timecode if there has been a problem, while audio delay can be used if you notice a constant, uniform AV sync issue during capture.

CLIP NAMING

When you are organising individual clips, a consistent naming structure will be a big help. Use some alphanumerics as code to sort your clips by scene and take — as well as descriptives — so you can sort your bins quickly. Try to describe each shot type too, so you can quickly spot all the different elements that will make up the scene coverage. For example, "s14-trevorlaughs-CU-02" might be a good name for the second take of a close-up on Trevor laughing in scene 14.

SCENE DETECTION — PRAISE BE!

Now that we've covered some of the textbook variety log and capture concepts, we can talk about the beautiful cheat available in many video packages — scene detection. This glorious development lets you set your tape to capture and on return you'll have a nice set of takes in your bin, sliced at each cut of the camera. A godsend for the lazy logger, but it does suffer from getting some detections wrong at times. But now that we've already been through the "right" way of doing things, you can fall back on them to correctly import problem scenes manually.

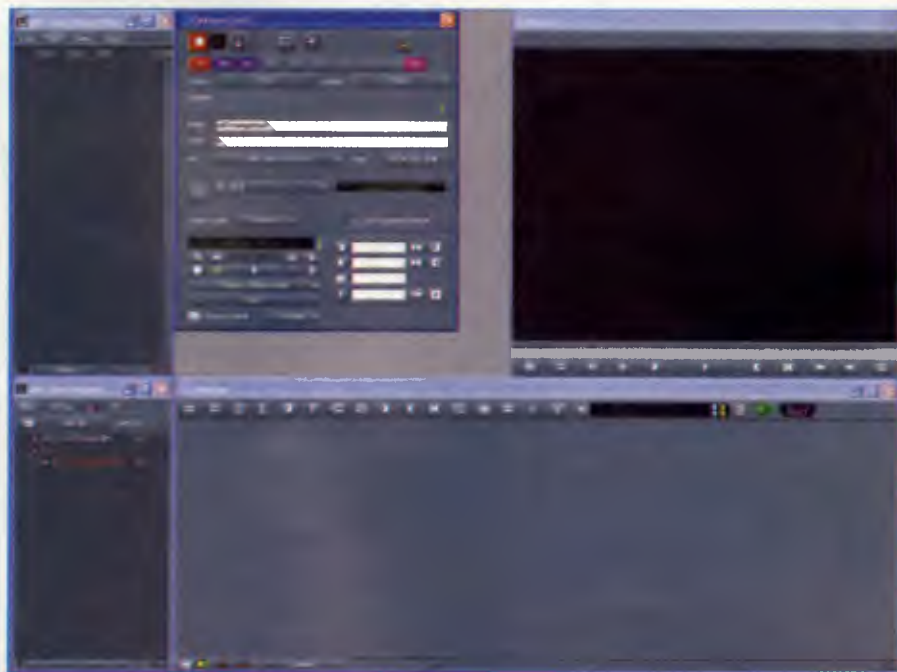
Perhaps the number one issue here is that the auto-scene naming will be meaningless. Spend some time previewing and renaming each cut after this kind of capture and you'll be in fantastic shape. This is another time when shoot logs can be a help.

ORGANISE YOUR BINS

Any devoted recycler knows that one bin just doesn't do the job — a little more commitment makes the whole thing more manageable. Likewise, you can't be too organised in your edit, so it's a great idea to file your footage into a series of related bins for easy access scene by scene. Much easier to open a specific bin with a couple of dozen clips — for the scene you're working on — than to have one bin of hundreds to fish through. A big edit can easily have thousands of clips, so good habits now will have you prepped for your four-hour grand opus. Once you've split up into separate bins, you might even find a few rogue clips in need of a better name.

STEP-BY-STEP: AVID FREE DV

- 1 Open the Tools > Capture window to access the capture controls in Avid Free DV.
- 2 You need to set your deck as a configuration option. With your camera or deck switched on,



Caught in the act: the Avid capture space is more compact, using the Composer window as its viewer.

choose Edit > Preferences > Deck Configuration. Choose Add Channel, select the way your camera is attached from the channel menu and choose OHCI as the port. Finally, choose Auto-configure so Avid will identify your device on that port.

- 3 Return to the Capture tool. Select V, A1 and A2 channels at the top — so you'll capture all parts of your footage (leave out the A1 and A2 if you just want video). When you use the controls in the bottom left, your footage will appear in the composer window to the right. For capture of specific timecode, enter the details in the in/out points in the lower right spaces.
- 4 When you're ready to go, select the record button in the top left to capture footage. Hit the same again to stop. When finished, the clip will be dropped into the selected bin. Repeat as necessary (don't forget to update the name and comment!).
- 5 Choose File > Import... to bring in other digital files if you need them.

STEP-BY-STEP: ADOBE PREMIERE PRO

- 1 Open the File > Capture window to prepare for performing your video capture. You can check and adjust any settings directly within this window if you feel the need.
- 2 In the Capture window you should have control over your camera or deck via the controls below the viewer area. In the bottom right of the controls area you can check the Scene Detect option (if you want to use this feature).
- 3 The Clip Data area on the right is used to build your clip logs. There is plenty of room for detail here, so fill in as much technical and artistic detail as you can.

- 4 If you already have fairly good log lists, you can manually build your digital logs by typing in your own timecode data below the Clip Data area — and then use the logs to import your clips. Feel free to leave a little room for error either side of your timecode.
- 5 To capture, you can click the red record button at the top right of the controls area (below the viewer) or you can choose the In/Out capture button to capture a clip based on timecode — or the Tape button to capture everything in one hit.
- 6 Import via the File > Import menu option. There is also an Import Folder option if you have a batch of clips to bring in at once. **END**

WHY WE CHOSE AVID AND ADOBE

- These Workshops aim to teach professional video editing concepts. Most consumer video editing software is designed for ease-of-use and lacks the controls found in professional video editors. Avid Free DV (a light version of Avid's professional broadcast editing packages) is the only free editor which incorporates many of these controls, while Adobe Premiere Pro is a popular high-end PC-based video editing package.

NEXT MONTH

- It might seem like we're on a go-slow, but next month we'll start on the fundamental skill in editing any film — the cutting. Sharpen those scissors!


```
tar -cvf dest target
```

where **dest** is the destination filename (or device if backing up to a tape drive) of the archive and **target** refers to the names of the directories and/or files that you wish to include in the archive. More than one target can be specified, allowing you to store data from different areas of the filesystem in the one archive.

The **c** switch is supplied to the tar command to instruct it to create a new archive. The **v** switch refers to verbose, which means that the command will display the name of each file that is added to the archive. Lastly, the **f** switch instructs tar to archive all data to a single file.

Another commonly appended switch is **z** — which instructs the tar command to filter the archive through GZip. For instance:

```
tar -cvfz ml18.tar.gz /home/jspiga/ml18
```

This argument should be used appropriately though. It's perfectly fine to use when you're packaging data to send to another person, but it should not be used for mission-critical backups. The reason for this is that if there is an error in compression, all of the data within the archive is not able to be retrieved. Mission-critical backups are best not parsed through GZip and left in uncompressed .tar files (and most tape drives handle compression in a native and recoverable manner anyway).

Whenever you've created a new archive, it's prudent to test the archive to ensure that tar can recover the data stored within it. To do so, use the **t** (test) switch as follows:

```
tar -tf archive
```

WHAT NEEDS BACKING UP?

One of the most difficult aspects of backing up is knowing what data to include. On a Windows XP system, most would back up as much of the obvious user data as possible (eg. most of the data under the Documents and Settings directory of the system drive). But after backing this up, there's always other data to be found in other areas of the file system (eg. C:\InetPub on an IIS-enabled system, and some user data that could be located under Program Files).

Knowing what to back up on a Linux system is just as much of a science. In general, you don't want to back up what you can easily restore from your installation media or from secure online sources (via **yum**). This is especially important to remember in the context of data integrity — if a rootkit has made its way onto your Linux system, you don't want to be restoring the malicious software on a fresh system from your backup.

In all cases, you will want to backup:
/home (contains all user home directories),

/root (the root user's home directory), /etc (contains all service configuration information) and /usr/local (contains local executable data installed by the users of the system).

It's also worthwhile perusing through the /var directory, as this area of the file system can also contain user data (especially the /var/www directory — which usually contains web data served by the Apache Web Server).

Lastly, it is good practice to write down your partitioning scheme on a piece of paper — that way, you can keep the same partition sizes if you have a catastrophic system failure. The following command will display the list of partitions on the primary master IDE drive (and should be run for all hard disk devices installed on your system):

```
fdisk -l /dev/hda
```

RESTORING FROM A TAR BACKUP

The tar command is also used to restore from your Tape Archive backup:

```
tar -xvf source
```

The only difference between the command used to create the archive and to restore it is that the **c** switch has been replaced by **x** (for extract). If the archive has been compressed with GZip, simply add the **z** switch in exactly the same manner as you did when creating the archive.

Care should be taken when extracting files from a tape archive. The data contained within the archive will overwrite any files and directories that already exist on your file system. You should always check the contents of your current working directory before extracting data from any archive.

If you only want to extract a subset of the data contained within an archive, a third argument can be passed to the command. For example, if you had a single archive backing up all of the data listed in the previous section and you only wanted to extract the data that was in the /root directory, the following command would be used:

```
tar -xvf backup.tar "/root/*"
```

It may take a while to restore a small subsection of data from a tape archive because of how the data is stored in the archive file. This is because each file is stored in a sequential manner within the file, and tar must read every file in the order it was archived.

AUTOMATING BACKUPS

One of the main advantages to using a CLI tool such as tar to perform backups of your system is that you can automate the process using cron — this way, you never have to remember to manually initiate a backup.

The following script (backup.sh) can be used to initiate automated daily and weekly backups of different sections of the file system:

```
#!/bin/sh
if [ "$1" = daily ]; then
tar -cf /daily.tar /home /root
tar -tf /daily.tar 2> /var/log/daily_backup.log
fi
if [ "$1" = weekly ]; then
tar -cf /weekly.tar /etc /usr/local /var/www
tar -tf /weekly.tar 2> /var/log/weekly_backup.log
fi
```

After you've created the script and saved it (as the root user), you'll need to schedule it so that it runs with appropriate arguments. Adding the following lines to the /etc/crontab file should do the trick:

```
0 5 * * * /root/backup.sh daily
30 5 * * 0 /root/backup.sh weekly
```

SYSTEM RESCUE

"Given a long enough timeframe, the survival rate for everything drops to zero" is a quote from one of my favourite movies, and it certainly applies to computer systems — sooner or later, every system fails. Even though Linux is a relatively stable and robust operating system, it's still handy to know how to recover when things do go awry.

```
- To install or upgrade in graphical mode, press the <ENTER> key.
- To install or upgrade in text mode, type: linux text <ENTER>.
- Use the function keys listed below for more information.
[F1-Main] [F2-Options] [F3-General] [F4-Kernel] [F5-Rescue]
boot: linux rescue_
```

Rescue me: to boot to rescue mode, insert your installation CD, boot to it and enter **linux rescue** at the boot prompt.



Mounted patrol: after your Linux file system has been detected and mounted, you can then start the rescue process.

If your Linux system won't boot, the first thing to check is your hardware. Is your system getting past the POST? Is your hard disk spinning up and being detected by BIOS properly?

If your hardware seems to be working properly, pop your first Fedora Core installation CD into your CD/DVD drive and boot to that. At the prompt, type in:

```
linux rescue
```

Skip the media test if you prefer and select the language that you wish to use. The rescue utility should then advise you that it will attempt to detect your Linux installation and mount it under /mnt/sysimage. In general, it's better to mount the installation as read-only — that way, you can't do more damage to the file system than what has already been done.

The rescue utility should confirm that it has detected your installation. If it does not find any data, there are not a lot of options available to you — recovery from these scenarios is possible but extremely difficult (and outside the scope of this Workshop).

ONCE MOUNTED...

If the rescue utility is able to detect your Linux installation successfully, a thorough file system check is usually all that is required in order to fix any storage subsystem errors. The **e2fsck** command should only ever be on unmounted file systems. You can obtain a list of mounted file systems associated with the detected Linux installation as follows:

```
mount | grep sysimage
```

Once the list is displayed, proceed to unmount all listed file systems:

```
umount /mnt/sysimage/proc
umount /mnt/sysimage/dev/pts
umount /mnt/sysimage/boot
umount /mnt/sysimage
```

Once all file systems are no longer mounted, run the **e2fsck** command with the **-f** switch (to force a full disk scan) on each hard disk in your system:

```
e2fsck -f /dev/hda1
```

The output from **e2fsck** will depend on what problems it encounters. Generally, it's safe to select the suggested options that the command gives you. Once the command has finished running (and it can take quite a while), type **exit** to get out of rescue mode and then reboot your system. With any luck, your system now boots.

IF ALL ELSE FAILS

If the file system check does not resolve your problems, it's probably a good idea to jump back into rescue mode and start salvaging your data using the backup techniques listed earlier in this Workshop. While it's possible that you could still recover from this level of system failure, you'll probably end up spending more

time trying to fix things than it would take to rebuild your system.

PREDICTING HARD DISK FAILURES

Because many Linux systems are built on older hardware, you should always be on the lookout for symptoms that your hard disk drive is failing. The telltale sign of hard disk failure is file system corruption, which has the following symptoms:

- Files which you know should contain legitimate data are replaced with random characters and nonsense.
- Filenames and directory names start having random characters in them, or files and directories start randomly appearing in locations.
- System crashes occur when you access a certain file.
- Files and directories disappear all of a sudden.

If any of these symptoms occur, it's worthwhile booting to rescue mode and running the **e2fsck** command as shown earlier.

However, you should heed these warning signs; even if running **e2fsck** initially fixes these issues, your hard disk is on the way out and will need replacing sooner rather than later. At this time, it's prudent to ensure that your backups are occurring more frequently and you are storing the backups on another drive or system.

DISCOVERING MALICIOUS NETWORK ACTIVITY

The last major alarm bells that ring from time to time are security problems related to rootkits, viruses and malware. To think that these nasty pieces of code are solely in the realm of Windows is naive, hence the reason why even Linux systems should have security measures such as firewalls implemented.

If you've taken enough preventative measures, you should have very little to worry about. However, you should always remain alert for the following symptoms:

- System logs reporting that users are logging on remotely using accounts that you're not aware of.
- Unexplained heavy network traffic.
- The appearance of new accounts in the /etc/passwd file, or the appearance of new groups in the /etc/groups file.
- Newly appearing SUID or SGID files (which usually indicates that someone is trying to, or already has, root access on the system — a sure sign that a rootkit may be installed).

If these symptoms start appearing, it's always a good idea to back up your data, format your system and re-install Linux — especially if you suspect a rootkit is installed. It's generally not worth the effort to try cleaning up such an infection — because you can't guarantee that you will close off every hole that a malicious user has exploited. The secure thing to do is to start again with a secure re-install. **ETTC**

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Amulet-seeking with Solaris 10

A desktop OS without games would be like a forest without orcs. Kind of. Fortunately, **Brendan Gregg** has managed to hunt down some games for Solaris.

BRENDAN GREGG

Brendan Gregg has been using Solaris for around a decade, working as a programmer, system administrator and consultant. He currently works as a contractor and sometimes teaches Solaris classes for Sun Microsystems. Brendan is involved with the OpenSolaris project and is the author of the DTraceToolkit.



SKILL LEVEL

- Intermediate

TIME TO COMPLETE

- Four hours (at least!)

While many companies develop games, very few have ever released them for the Solaris platform. This is hardly surprising, as there has only been a small number of home Solaris users. However, this is changing with the new desktop features in Solaris 10.

SPECIFICALLY FOR SOLARIS 10

The Java Desktop System in Solaris 10 comes with a small collection of desktop games which are easily found by clicking on Launch > Applications > Games. Most originate from the GNOME desktop environment and include favourites such as GNOME Mines and Spider Solitaire. Plus, there's GNOME Stones (reminiscent of the classic Boulderdash).

There are also a huge number of free Java games on the net. Some play straight from the browser; others can be downloaded and run from the command line. Java games generally work well on Solaris (Sun did invent Java). Some of the easiest are those that can be downloaded as a .jar file, which can be run using `java -jar filename.jar`.

REQUIREMENTS

- Solaris 10 (the full version was provided on the APC July 2005 cover DVD).

PORTS

Some games have been ported to Solaris, eg. id Software titles such as Wolf3d, Doom and Quake. These ports are usually written by enthusiasts and can be downloaded for free, so long as you provide the data files yourself (from the original CD-ROMs). They aren't hard to find (try Googling "solaris quake"), but try to find packaged binaries/executables rather than the source code (which requires compilation). If you must compile some code however, try the following:

```
PATH=$PATH:/usr/sfw/bin:/usr/ccs/bin
./configure
make
```

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Try **make** if **gmake** fails. Run the new program using `./filename`. You're likely to encounter a high failure rate here so read the documentation carefully (look for readme files), edit "Makefiles" and try again. The games list on www.solaris4you.dk/sunsolaris.html is one of the most complete I've seen.

ROGUE-LIKE GAMES

The classic Rogue (M. Toy, K. Arnold, G. Wichman, 1980) began a genre of games which will run on Solaris and are available as freeware. These are usually text-based games where you are an "@" symbol and travel through dungeons defeating orcs "o", dragons "d" etc. Your character has attributes that can be improved through experience and there are a plethora of treasures, equipment, weapons and armour to be discovered in the dungeons.

People nowadays often turn their nose at text-based games. True geeks, however, become misty-eyed as they reminisce over the great text battles they have fought in the past. Text-based games stir the imagination in a way modern eye-candy cannot.

Popular Rogue-like games were Moria (1983-90), Nethack (1987), Angband (1991+), Zangband (1994+), Kangband (1997+) and ToME (2004+). They are very open-ended and challenging. Few people have actually finished any of these games (without cheating!), and to do so is a great badge of honour amongst ubergeeks.



Achtung baby: V. Filatov's Wolf3D port.

Angband is the easiest to get working on Solaris. Fetch the Solaris Intel/compatible version from www.thangorodrim.net. Try the mirror link if the first link fails. To extract the game, type `gcat filename | tar xvf -` while in your home directory or a games subdirectory. Then `cd` to the extracted angband directory and type `./angband`. This also works over an ssh session, as the game is text-based. See the Help section on the site for a beginners guide.

Zangband is popular for its world map of dozens

of cities and towns. If you don't like what the shops are selling in your home town, you can wander through the wilderness to find other towns. Or try to — you'll be attacked by tigers and other animals. The source code is available from the Thangorodrim web site, and will need to be compiled (see above).

ToME is a new variant that boasts a complex skill system. See the web site at <http://t-o-m-e.net>. It also needs compilation as with zangband. I do warn you: these games are very addictive. ☺☺☺

Protection 5 9

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1 Thermaltake Rocket liquid cooling system

● PRICE \$249 ● ONLINE www.thermaltake.com.au ● CONTACT Thermaltake ● VERDICT 3/5

When your geekhood is in question, there's only one true solution: only a huge, phallic PC component can regain your former status as king of the computer world — and Thermaltake has just the thing. Water cooling has never

been so vertical, with this passive aluminium tower dubbed "the Rocket". The good thing is that it's fanless — so, very quiet then, but don't expect to move your PC around much after it becomes the launch pad.

2 Photoshop Elements 4 Solutions: The Art of Digital Photography

● PRICE \$46.95 ● PUBLISHER John Wiley and Sons ● ISBN 0782144462

This clearly presented book covers the newly released Photoshop Elements 4, which offers an affordable subset of Photoshop CS2's features (especially for digital photographers). *Solutions* assumes a reasonable level of

computer knowledge; it progresses from an Elements 4 overview to looking at image correction, compositing, panoramas, advanced techniques, and finally printing and sharing. A good companion for first-time users.

3 Hasselblad 503CWD digital camera

● PRICE Around US\$14,000 ● ONLINE www.hasselbladusa.com ● CONTACT Hasselblad ● VERDICT 5/5

The Hasselblad 503 has been a staple of professional photographers since time immemorial, but film is so 1990s. Commemorating the 100th birthday of the late Victor Hasselblad, the young'uns in charge have decided to

spruce up the 503 for the modern shutterbug. Only 500 will be released, so get in line early. It features a whopping 16 megapixels, Carl Zeiss Planar lens 2.8/80mm and FireWire 800. Storage is on CF and it comes with a 1GB card. Nice.

4 Oracle Data Warehouse Tuning for 10g

● PRICE \$119.50 ● PUBLISHER Elsevier Digital Press ● ISBN 155583350

Q: What is a data warehouse? **A:** It's a database designed for single transactions of a large size or detailed analytical queries. They require lots of throughput and use lots of server resources. If you didn't know that already, then this

isn't the book for you. However, if you're the DBA for one of these monsters then this book might be worth a read, with detailed examples in every chapter showing real-world situations and what can be done to fine-tune performance.

5 Retro Phone Handset

● PRICE US\$29.99 ● ONLINE www.thinkgeek.com ● CONTACT ThinkGeek ● VERDICT 4/5

Sometimes, seriously untrendy items go so far down the cool scale they wrap around back to the top. This is one of those items. Presenting: the Retro Phone Handset. It's big, black, looks like a prop on *That '70s Show* and, boy howdy,

you'll turn heads on the street. It works with most Nokias and a bunch of Sony-Ericsson phones via an adaptor, requires no batteries, recharging or any of that new-fangled technology. Your granny understands.

6 ASP.NET in 60 Minutes a Day

● PRICE \$77.95 ● PUBLISHER John Wiley and Sons ● ISBN 0471430234

ASP.NET is a hot topic, with the recent release of Visual Studio 2005 and an upsurge of interest in web services and thin-client technology. Unfortunately, this book focuses solely on ASP.NET version 1.1. Still, it's an extremely lucid

guide to learning how to write clean, scalable code. Advanced topics include web controls, security, performance, data manipulation, and caching. Recommended heartily for new ASP.NET programmers.

7 AV Voice Changer Software Diamond Edition 4.0

● PRICE US\$99.95 ● ONLINE www.audio4fun.com ● CONTACT Audio4fun ● VERDICT 4/5

Voice Changer is the ultimate tool for spinning out your friends in online voice chat. The software morphs your voice to sound like a man, woman, old person — or even an animal (don't ask). Version 4.0 lets you approximate the

sound of famous artists and singers using something called a "voice comparator module". It's not perfect, but we haven't seen anything else quite as wacky. Check out this month's cover DVD for a special upgrade offer.

8 Windows XP Cookbook

● PRICE \$79.95 ● PUBLISHER O'Reilly ● ISBN 0596007256

The *XP Cookbook* has a stack of useful information for home users, from getting to grips with digital media to customising the XP interface and exploring all aspects of networking. It's also good for administrators, with great

coverage of installing XP remotely, managing services, security, auditing and backups. The examples are well-constructed and technically sound, offering great learning tools for all readers, whether power users or beginners.



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HIGH PERFORMANCE

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PREVIEW

UberSoldier

After the 1337 Soldier project was terminated, the Nazis moved on to bigger things. Declan Kennedy learns that bigger isn't always better.

CONTACT QVS • ONLINE www.ubersoldier.net • PRICE \$49.95

GOOD Nice visuals and audio. • BAD Completely lacking in polish or imagination; genuinely offensive and derivative.

Sometimes a game comes along that blurs the boundaries between fact and fiction, poses the deep questions about history and the human condition and prompts the player to reconsider their very existence. (This is not one of those games.)

UberSoldier is yet another dumb shooter where the player is charged with blasting wave after wave of — wait for it — Nazis. The premise is as thin as summer lederhosen. Basically, you play a recently deceased German officer who is resurrected and has gained (cue booming voice) "Uber-natural powers". Not supernatural, mind you. *Uber-natural*.

What this amounts to is the ability to create a shield around you which stops bullets. You can then redirect these bullets at your "cruel Nazi masters". Other than that, it's a run-of-the-mill shooter which uses World War II weaponry.

Graphically, the game shows a lot of initial promise. Making extensive use of Shader Model 2.0 routines (with compatible video cards of course), the game features some next-gen rendering tidbits such as full scene normal and specular mapping, and volumetric effects like smoke and explosions. But character design is incredibly poor, which detracts from what the engine does well.

Physics are handled very well. The rag-doll physics are among the best we've seen to date. Unfortunately, the developers seem to be really proud of them too, so things often explode without explanation.

Believe it or not — these are the good points. Now, let's look at the bad. The story is truly awful: a confused mix of mysticism and rebels fighting against their evil overlords. That the game was developed by Germans doesn't make the Nazis-are-evil plot any easier to swallow. It's exploitation theatre of the lowest order.

The combat system seems awkward, unwieldy and derivative. You can aim with your gun sights and melee attack at close range; you can use special powers (and there are some vaguely supernatural moments in the game).

Movement feels horribly wrong. For example, you can run at about Quake-speed (unrealistically fast), but you can only jump about 10cm in the air, which makes no sense.

AI is notably absent. The Nazis appear to have transplanted the brains of every cop in Vice City into their troops (even down to the bad one-liners they yell at you... in English... with American accents, no less).

Movie physics are truly shocking, with doors never sure which way they should be opening and elevators and platforms which

seem to shake objects around them like they've just received an SMS.

As it stands, this preview was a horrifying vision of a future that I hope never comes to pass. Another year of development would turn this into a playable game. Don't hold your breath.

You put your left arm in... Unfortunately, the hokey-pokey isn't an in-game option.



JOYTECH

www.joytech.net



Commandos: Strike Force

William Maher dusts off his rifle and takes another relaxing tour of the countryside with some cheese-eating surrender monkeys.

● **CONTACT** Atari ● **ONLINE** www.atari.com.au ● **PRICE** \$89.95 ● **VERDICT** ★★☆☆☆
● **GOOD** Rag-doll physics; fast load times. ● **BAD** Corny voice acting; same old scenarios.

For some crazy reason, Pyro Studios also thought that maybe gamers hadn't had enough of drilling holes in virtual Nazi bodies, so again we find ourselves in familiar WWII surroundings. Quaint little French villages? Check. Majestic Norwegian mountain tops? Check. The city of Stalingrad? Bombed into umpteen million craters.

On first impressions, this is a bit of a poor man's Call of Duty 2. You engage combatants deep into German enemy lines, but the graphics and scenarios don't seem quite as polished and the voice acting is just corny.

Stick with it though, because there are a few saving graces. An addition to the formula is the ability to switch between three different hero units within a level — sniper, green beret and spy. For example, you can take the role of the Nazi uniform-wearing spy who holds up German traffic at a roadblock — then switch to sniper for the ambush.

The gameplay is solid, including a slow-motion effect that kicks in whenever you hold your breath while using the sniper scope. Nope, it's not very original, but the effect is powerful in combination with Commandos'

rag-doll physics engine. When you nail a running enemy at 500 yards, they flail to the ground convincingly.

Be prepared for a few laughs though. In one of the early levels, after planting dynamite on a bridge, we discovered some sort of weird invisible wall blocking our escape. A strong hint that you should heroically sacrifice yourself — or just a programming bug?

Overall, this is a playable game let down by an underwhelming intro and tedious early levels. It doesn't look as amazing as Call of Duty 2, but the scenery and atmosphere do get better (and the loading times are much quicker).



Ah... home sweet home.

It was the allied soldiers who actually invented the Vulcan nerve pinch.



Crashday

Beefy cars, generous gravity and nitro — what could possibly go wrong? Dan Chiappini takes a crash course... in crashing.

● **CONTACT** Atari ● **ONLINE** www.atari.com.au ● **PRICE** \$49.95 ● **VERDICT** ★★☆☆☆
● **GOOD** Pumping soundtrack; smashing up cars. ● **BAD** Deja vu all over again.



"And the Oscar goes to..."



Now pimp it!

Racing games are an established part of the gaming market, but they generally fall into three major categories: straight-out racing, destruction or stunts. Crashday combines them all and gives you the option to either fang it around the track, blow up your competitors, or do both at the same time — while defying the laws of gravity.

The game has seven modes: run-of-the-mill racing against AI competitors; test drive, which lets you familiarise yourself with tracks; stunt show, which sees you going for the best possible score from stacking your ride;

wrecking match (*à la* destruction derby), that pushes you into a kill-or-be-killed arena, and so on. There's also a Speed-clone mode (forcing you to drive hard and fast — because if your speed drops below a certain threshold you're eliminated) and a couple of car-spinoff versions of capture the flag, and a bunch of mini games — two of which are the equivalent of Winter Olympics ski jumping (but with nitro and bombs). Potential demonstration sports if ever there were some.

Visually, the game looks like the bastard-child of TrackMania meets one of the Need for Speed:

Underground games, with high-res and super-shiny vehicle models and moody terrains. While the cars look good — and the destruction is fantastic — it gets a little old quickly (unless you're willing to push at the career mode). There is a sandbox editor to create your own tracks — throw in some craters and mounds, hit the nitro and see where you land.

If your memories of Stunts are as fond as ours (but you just can't find that damn floppy disc), this game is a great way to rekindle the love (we just don't think it'll be as memorable in the long term).



QUALITY ACCESSORIES FOR QUALITY ENTERTAINMENT



Virtual Skipper 4

Nick Race steps up to the poopdeck and starts yelling.



"We're gonna need a bigger boat."

● CONTACT QVS ● ONLINE www.virtualskipper.com ● PRICE \$69.95 ● VERDICT ★★★★★

● GOOD Great-looking and quite enjoyable. ● BAD The tutorial leaves a lot to be desired; basic animation.



"Tack me! I said Tack me you Jib!"

High seas. Deep terror. Try to stay calm.

Spi, Code 0, Genoa, Jib, Helm, Spinnaker, Jibe, Tack, laylines, douse, "in irons" and "abaft the beam" are all terms that I learned while playing Virtual Skipper 4 (VS4). This may help me to be a little less baffled when watching the Sydney to Hobart on telly, but it's hardly life-changing. The same goes for Virtual Skipper 4. It's a cracker of a yacht racing simulation... for what it's worth.

For a complete sailing beginner, the game isn't too hard to pick up and get started with, though the tutorials are very light on information — along the lines of "win this race by putting up the Genoa when you round the buoy". After getting used to the interface

though (and a little fiddling to establish which sails should be raised when, how to tack effectively etc.) you'll be itching to take on the masses.

VS4 has a full multiplayer mode (both online and on LAN) and, considering the low overheads with such a slow-moving game, it plays like a Bahaman dream. Graphically, the game is extremely well-polished — the water looks great, wind effects are excellent and the boats look like works of art (except for your crew members, who only manage to move their legs twice whilst crossing the width of a trimaran). The game gets progressively more

challenging with each race, and a full map editor — for local and multiplayer modes — is complete and comprehensive.

Real sailors will be pleased that the game follows proper ISAF rules, and boats can be sailed in "simulation mode" for real handling conditions (without the visual clues such as wind direction).

If you are looking for a fast-paced, twitchy game with loads of sugar and heart-rate-escalating action, then this isn't it. However, Virtual Skipper 4 offers a solid chunk of escapism and challenge in an easily digested and polished serve. But don't be fooled, it gets hard.

Tycoon City: New York

With bloodshot eyes and a dozen espressos, Dan Chiappini re-creates the city that never sleeps.

● CONTACT Atari ● ONLINE www.atari.com.au ● PRICE \$69.95 ● VERDICT ★★★★★

● GOOD Easy learning curve; great visuals. ● BAD Lack of rampaging monsters.

If you're a gamer with few interests outside of capitalism and asset micromanagement, then this game is for you. TC:NY is similar to all the other sim games, regardless of the location in which they've been set. Think RollerCoaster Tycoon meets Sim City and you're on your way.

As an upshot, if you've ever wanted to reduce the New York City skyline to dust and start over, now is your chance. The game has two modes: sandbox and career, the general gist of which is to build New York

from the ground up and ultimately acquire bulk wealth.

While the game mechanics are solid and the models and texture are well done, from an objectives point of view, there's not really the same sort of pressures as a lot of other sim games. Kids won't throw up on your rides, you don't need to pay taxes or negotiate salaries, and monsters don't occasionally get a little stick time with your city's face.

A "sphere of influence" shows you a coloured view of buildings that can be upgraded (in order to turn a few used-clothes shops into

a district). From time to time, opportunities will pop up — for example, hosting a Halloween parade will require objectives such as more accommodation or greater levels of satisfaction in order to complete.

In a nutshell, the game revolves around constructing buildings, upgrading them and waiting for the cash to roll in.

It's not a new concept, and some might find it a little basic as you can't really fail anything, but it's great for casual gamers and works well as a pick-up-and-go sort of game.



"We're gonna have to clear this entire neighbourhood."



"It's time to leave your homes, people. Let's move."

Rome Total War Gold Pack giveaway

To celebrate the announcement of Medieval 2: Total War, we've got five copies of Rome: Total War — Gold Edition (including the Barbarian Invasion expansion) to give away.

All you need to do is answer a simple question: Which development studio is behind Medieval 2: Total War?

Put your answer on a piece of paper, bung it in an envelope labelled

"APC Rome Total War competition" and send it to us at GPO Box 4088, Sydney 2001. Remember to include your name and a return address so we can get your prize out to you if you're a winner.





An American newspaper has tracked down and interviewed a "spam king" who lives in an 8,000 square foot mansion and sends 650,000 emails an hour from 190 mail servers under his control. The journalist "let slip" that he had tracked down the spammer's address in "Oakland County real estate records". That information, coupled with a few other descriptive details, were enough for Slashdot readers to work out where he lived. Their revenge: "They've signed me up for every [postal mail] advertising campaign and mailing list there is," the spammer howled to the original reporter. "These people are out of their minds. They're harassing me!"

MEATJET PRINTING

While the base design of an inkjet printer has been used to create flexible displays and printed circuit boards, the latest developments out of the US are not for the sheepish. Scientists from the Medical University of South Carolina and Clemson University have developed a way to use the common inkjet printer to create 3D biological structures. The printer sprays cells onto moulds pre-built in a thermo-reversible gel. These cells then form together around the mould, which can be easily dissolved afterwards, creating what is essentially a tube of meat. The APC labs team is currently adapting this technology to create a printer that is capable of a sustained 30 kebab-per-minute speed.

That's it... You're a FOX!
YES! You're sly, sultry,
silent and beautiful...

Ass no questions

What the... did that Firefox installer just download from Playboy.com? Yep, it seems that not only is Playboy.com an official Firefox mirror, it is also hosting other high-profile open source projects including Fedora Core, FreeBSD and Apache. The obvious explanation? When Hugh Hefner saw "OSS", he thought it said "ASS".



PHOTO: Darren Ellis - www.flickr.com/photos/dellis/

Discourage Mr Ant from your laptop

You wouldn't believe the range of problems Bangladeshi computer users have to put up with. Extracts from recent posts on the "ICT Bangladesh" Yahoo! Group:

Omar Al Zabir writes: "Is there any safe solution which prevents insects like ants from going inside my laptop and eating up the circuit board, wires and sweet plastic layers?"

Shariful Arif replies: "Here is some solution:

1. Get a tray and put water on it; make a platform on the middle of it; put your laptop on the platform. Result: ants can't swim, they could not reach up to your laptop over the water.
2. Don't eat anything when you work on your laptop.
3. Keep some sugar or honey in the corner of your room so that ants will be attracted by sugar and leave your laptop.
4. Arrange a small wire to make ground connection so that the excess electricity passes through that. Ants like electricity. It will reduce the extra electricity from your laptop.
5. Come to Saudi Arabia there is no Electricity lover Ant."

Tasdiq Ahmed replies:

"I fall in same situation... but by a lizard. It entered the power supply of my desktop so when I powered the PC it just boomed!!! Now I am worried about laptop after hearing from you... In market some chalks are available for cockroach and other insects. We can buy and draw some line around the laptop!!!"

Salim Ullah replies: "We experienced to keep away the Mr Ant from lots of our notebook users.

1. Keep clean the desk to discourage Mr Ant.
2. Keep some pack of silica inside the notebook bag so that it keep moisture free.
3. Go to the residence of Mr Ant. Say good-bye by destroying his colony.
4. Keep some Naphthalene ball inside your notebook, insect will hate your notebook and you will be charmed with sweet smell.
5. As Mr Tasdiq said, chalk may be used in the home, but never try to use it inside the notebook. Chalk works good for cockroach."

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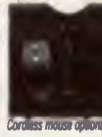
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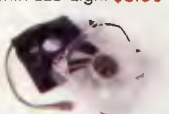
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Model	Genuine	TONNY
BCI-3eY	\$19.00	\$6.40
BCI-3PC	\$19.00	\$6.40
BCI-3PM	\$19.00	\$6.40
BCI-6BK	\$24.00	\$6.40
BCI-6C	\$24.00	\$6.40
BCI-6M	\$24.00	\$6.40
BCI-6Y	\$24.00	\$6.40
BCI-6G	\$24.00	\$6.40
BCI-6R	\$24.00	\$6.40

Model	Genuine	TONNY
BCI-6PC	\$24.00	\$6.40
BCI-6PM	\$24.00	\$6.40
BCI-11BK	\$19.00	\$4.90
BCI-11C	\$34.00	\$7.20
BCI-15BK	\$24.00	\$6.40
BCI-15C	\$44.00	\$7.20
BCI-16C	\$44.00	\$7.20
BCI-21BK	\$13.00	\$4.90
BCI-21C	\$28.00	\$6.40

Epson Ink Cartridges

Model	TONNY	Model	TONNY	Model	TONNY
T001	\$18.90	T0321	\$10.80	T0631/2/3/4	\$7.50
T003	\$ 9.90	T0322	\$ 9.50	SO20089	\$9.90
T005	\$18.00	T0323	\$ 9.50	SO20093	\$5.10
T007	\$ 9.30	T0324	\$ 9.50	SO20097	\$9.00
T008	\$13.00	T0422C/M/Y	\$ 9.50	SO20108	\$6.50
T009	\$15.00	T0461	\$ 8.90	SO20110	\$9.50
T013	\$ 4.50	T0472/3/4	\$ 8.90	SO20187	\$5.10
T014	\$ 7.90	T0491/2/3	\$ 8.90	SO20189	\$6.50
T017	\$ 9.70	T0494/5/6	\$ 8.90	SO20191	\$9.00
T018	\$10.60	T0540/1/2	\$ 8.90	SO20193	\$9.50
T026	\$ 9.70	T0541/2/3/4	\$ 8.90		
T027	\$12.40	T0547/8/9	\$ 8.90		
T028	\$ 9.70	T0561/2/3/4	\$ 8.90		
T029	\$10.60	T5591/2/3	\$ 8.90		
T038	\$ 9.60	T5594/5/6	\$ 8.90		
T039	\$10.60	T0621	\$ 8.90		

HP Ink Cartridges

Model	Genuine	TONNY	Model	Genuine	TONNY
51625A (#25)	\$46.00	\$28.00	C6614A (#20)	\$44.00	\$24.00
51626A (#26)	\$46.00	\$28.00	C6615DA (#15)	\$44.00	\$24.00
51629A (#29)	\$46.00	\$28.00	C6625A (#17)	\$48.00	\$30.00
51633MA (#33)	\$41.00	\$32.00	C6656AA (#56)	\$32.00	\$24.00
51645A (#45)	\$46.00	\$24.00	C6657AA (#57)	\$51.00	\$32.00
51649A (#49)	\$48.00	\$28.00	C6658AA (#58)	\$37.00	\$26.00
C1823D (#23)	\$51.00	\$30.00	C8727A (#27)	\$31.00	\$24.00
C4841/2/3/4AA (#10)	\$46.00	\$28.00	C8728AA (#28)	\$35.00	\$26.00
C5010DA (#14)	\$47.00	\$24.00	C8765WA (#94)	\$31.00	\$27.00
C5011DA (#14)	\$35.00	\$26.00	C8767WA (#96)	\$42.00	\$33.00
C6578D (#78)	\$51.00	\$30.00	C9363WA (#97)	\$45.00	\$36.00

Brother Ink Cartridges

Model	Genuine	TONNY	Model	Genuine	TONNY
LC-21BK	\$30.00	\$7.90	LC-04C/M/Y	\$16.00	\$7.50
LC-21C/M/Y	\$17.00	\$7.50	LC-47BK	\$32.00	\$7.90
LC-02BK	\$21.00	\$7.90	LC-47C/M/Y	\$18.50	\$7.50
LC-02C/M/Y	\$11.00	\$7.50	LC-800BK	\$32.00	\$7.90
LC-04BK	\$28.00	\$7.90	LC-800C/M/Y	\$18.50	\$7.50

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Model	Genuine	TONNY	Model	Genuine	TONNY
12A1970	\$48.00	\$32.00	10N0016	\$46.00	\$36.00
12A1980	\$56.00	\$35.00	10N0026	\$49.00	\$39.00
17G0050	\$46.00	\$32.00	15M0120 (#20)	\$53.00	\$41.00
17G0060	\$53.00	\$35.00	18C0031 (#31)	\$43.00	\$35.00
13400HC	\$53.00	\$36.00	18C0034 (#34)	\$43.00	\$35.00
13619HC	\$52.00	\$38.00	18C0035 (#35)	\$45.00	\$37.00
10N0217	\$33.00	--	18L0032 (#82)	\$47.00	\$39.00
10N0227	\$35.00	--	18L0042 (#83)	\$53.00	\$41.00

HP Black Toner Cartridges

Model	Genuine	TONNY	Model	Genuine	TONNY
92298A	\$139.00	\$ 65.00	C8061X	\$165.00	\$ 85.00
C3906A/F	\$ 95.00	\$ 49.00	Q1338A	\$189.00	\$ 95.00
C3903A	\$120.00	\$ 59.00	Q2612A	\$ 95.00	\$ 59.00
C3909A	\$220.00	\$ 95.00	Q2613A	\$ 95.00	\$ 59.00
C4092A	\$ 87.00	\$ 49.00	Q2613X	\$125.00	\$ 69.00
C4096A	\$135.00	\$ 65.00	Q2610A	\$155.00	\$ 75.00
C4127A	\$145.00	\$ 65.00	Q2624A	\$ 96.00	\$ 59.00
C4127X	\$169.00	\$ 80.00	Q5942A	\$190.00	\$ 95.00
C4129X	\$210.00	\$ 95.00	Q5942X	\$279.00	\$125.00
C4182X	\$239.00	\$135.00	Q5949A	\$ 99.00	\$ 59.00
C7115A	\$ 89.00	\$ 49.00	Q5949X	\$169.00	\$ 75.00
C7115X	\$115.00	\$ 65.00	Q6511A	\$169.00	\$105.00

TONNY Colour Toner Cartridges

Printer Model	Model	Genuine	TONNY
HP LJ1500/2500, Canon LBP2410	C9700A (BK)	\$115.00	\$ 65.00
	C9701/2/3A (CYM)	\$135.00	\$ 79.00
HP LJ4600, Canon LBP2460/2040	C9720A (BK)	\$199.00	\$155.00
	C9721/2/3A (CYM)	\$262.00	\$185.00
HP LJ4500	C4191A (BK)	\$119.00	\$ 59.00
	C4192/3/4A (CMY)	\$165.00	\$ 69.00
HP LJ8000	C4149A (BK)	\$150.00	\$ 89.00
	C4150/1/2A (CMY)	\$225.00	\$155.00
Epson C900/1900	S050100 (BK)	\$ 99.00	\$ 79.00
	S050097/98/99 (CMY)	\$210.00	\$119.00
Epson C1000/C2000	S050033 (BK)	\$119.00	\$ 90.00
	S050034/5/6 (CMY)	\$249.00	\$119.00

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Model	Genuine	TONNY
ML-1210D3	\$ 94.00	\$ 59.00
ML-1650D8	\$185.00	\$105.00
ML-1710D3	\$ 98.00	\$ 59.00
ML-2150D8	\$185.00	\$140.00
ML-4100D3	\$ 99.00	\$ 83.00
ML-4500D3	\$119.00	\$ 73.00
ML-6060D6	\$155.00	\$ 93.00
SCX-4216D3	\$ 99.00	\$ 79.00
SCX-5312D6	\$ 95.00	\$ 79.00
SF-5100D3	\$ 89.00	\$ 59.00

Brother Toner Cartridges

Model	Genuine	TONNY
TN-100	\$ 29.00	\$23.00
TN-200	\$ 42.00	\$23.00
TN-2025	\$ 74.00	\$59.00
TN-300	\$ 42.00	\$23.00
TN-3060	\$125.00	\$65.00
TN-8000	\$ 43.00	\$23.00
TN-6600	\$ 99.00	\$65.00
TN-7600	\$125.00	\$65.00

Lexmark Toner Cartridges

Model	Genuine	TONNY
Optra E210	\$129.00	\$59.00
Optra E310	\$225.00	\$69.00
Optra E/E+	\$135.00	\$59.00
X215	\$105.00	\$59.00

Canon Toner Cartridges

Model	Genuine	TONNY
EP-22	\$ 99.00	\$49.00
EP-25	\$ 99.00	\$49.00
EP-26	\$109.00	\$69.00
EP-32	\$145.00	\$65.00
EP-52	\$185.00	\$80.00
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NEW FAXSTREAM DUET SWITCHES Will allow any Fax or Modem device to operate with the Telstra FaxStream Duet service. Provides fully automatic fax reception, just like having a separate line. Two models are available. 	NEW INTELLIGENT FAXSWITCH FAX SWITCH will allow your existing Fax Device to connect to any Single Telephone line or a Multi Line (PABX) phone system, to provide for FULLY AUTOMATIC Fax operation. Will operate with all existing telephones and also an Answering machine. 	NEW INTELLIGENT MODEMSWITCH MODEM SWITCH allows your existing Data Modem Device to connect to any Single Telephone Line, Fax Line or a Multi Line (PABX) phone system, to provide for FULLY AUTOMATIC Dial In & Dial Out Modem Data operation. Models available that allow up to 8 devices on 1 line. 	NEW EFTPOS SWITCH EFTPOS switch will allow your existing EFTPOS device to share any existing Single Telephone Line, Fax Line or a Multi Line (PABX) phone system. Provides automatic connection on dialing. BARGE-IN protection prevents interference when line is in use. Alternative model will allow operation on 2 lines. 
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MISCELLANEOUS TELEPHONE LINE APPLICATIONS

NEW VOIP SELECTOR This device will allow you to connect one or more telephones to your TELEPHONE LINE and VOIP LINE. Incoming calls from either line ring on the connected telephone(s). Outgoing calls are automatically DEFAULTED to ONE LINE, but the alternative line can be selected by DTMF code. 	UPDATED TWO LINE SELECTOR Premium device will allow you to connect one Telephone Device to two Telephone lines (Telstra, Optus, VOIP, PABX etc). Ideal for EFTPOS, Cordless Phones, Modems etc. Additional features are provided, including automatic (or manual) selection of an alternative line if the default line is busy. 	TELEPHONE CALL TRANSFER Easy-Transfer will allow you to answer a call on one telephone and then TRANSFER the call to another telephone fitted to the same line. Also provides INTERCOM facility. Uses your existing telephones. 	MULTIPLE NUMBER SWITCH Operate Two numbers on one line. This device will connect your Multiple number calls to one set of phones or answering machine and your Normal number calls to another set of phones or answering machine. 
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MISCELLANEOUS TELEPHONE LINE APPLICATIONS

TELEPHONE LINE SIMULATOR This TELEPHONE LINE SIMULATOR can be used for testing, programming & demonstration of analogue telecommunications equipment, without the need to use a telephone line and generating costly calls. 4 Models are available. 	NEW RING INDICATOR This device detects incoming calls and will close/open a relay to match the cadence of the incoming ring. Can also be set to close a relay until a call is answered. Ideal for control of external horns or lights to advise of an incoming telephone call. 	REMOTE TELEPHONE ACTIVATOR Call in to Switch ON, Switch OFF or RESET your PC, SERVER or any electrical equipment by telephone line using touch tone commands. RTA connects to any telephone line. Requires PCU accessory. 3 models are available. 	POWER CONTROL UNIT PCU connects direct to the RTA and also to your power socket to allow telephone line dial in switching of the 240V supply connected to your equipment. Easy Plug In User Installation. Controls up to 10 Amps. 
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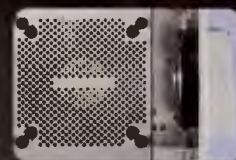
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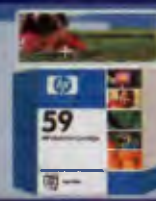
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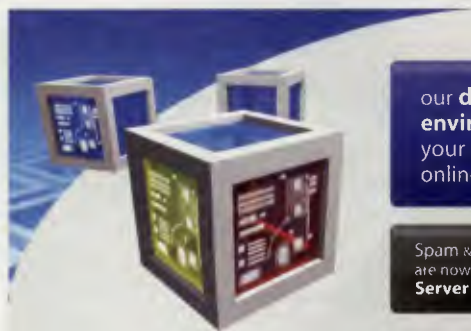
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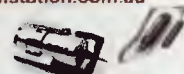
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Case Xeon/P4 Dual Core

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At Capax, we have been supplying the duplication market with the best name CDR/DVDR at unparalleled prices: Taiyo Yuden, Hewlett Packard, Ritek, Prodisc, Verbatim, Optodisc and Digimedia. Visit our website for a full range of CDRs, DVDRs, businesscards and 8cm media.



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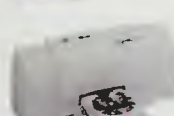
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ip 5200
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see page 30

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\$1699**

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hp

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- Powerful AMD 2GHz
- 1 GB RAM
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- XP Pro

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ONLINE SUBSCRIPTION CENTRE

To help you more **easily manage your communication preferences** with us, we offer a complete Subscription Centre online at **ht.com.au**

You can manage both your subscription preferences for email, mail, fax and phone online and update your Contact Details, so we'll always know where to reach you.

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To access the Subscription Centre, **you need to be a registered website user**. Registered users simply Log On as usual with your email address and password. Once logged on, use the links to the left to update your Contact Details, manage your Address Book or Manage Subscription.

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WHAT IF I HAVEN'T REGISTERED BEFORE?

If you have not previously registered, go to **ht.com.au/register** and enter the requested details. Once this is complete, go to Step Two as detailed to the right.

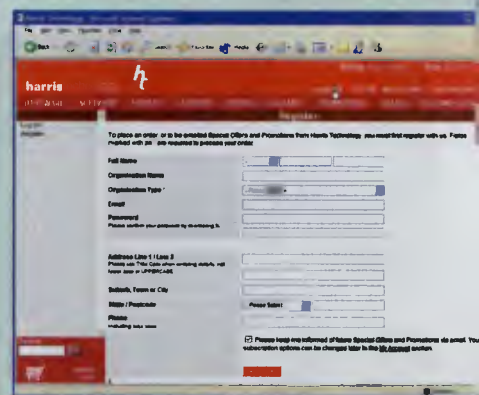
LOGGING OFF

To Log off when you have finished your website session, please click on My Account at the top right of the page and use the Log Off link that appears to the left.

We hope you'll find this new website feature useful, and we look forward to continuing to **share our latest and greatest offers** with you via your chosen communication methods.

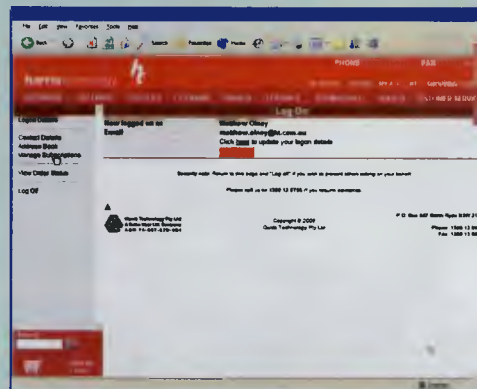
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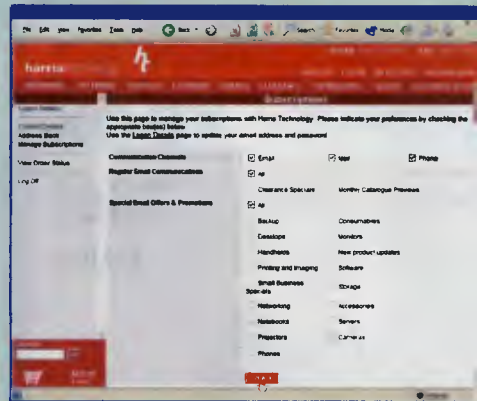
STEP ONE – LOG ON OR REGISTER

Registered users will be able to Log On as normal using their email and password. First time users will need to follow the instructions to the left under 'WHAT IF I HAVEN'T REGISTERED BEFORE?'



STEP TWO – SUBSCRIPTIONS

Once you have logged on, click the Manage Subscriptions link to the left of the page.



STEP THREE – UPDATE

Make any desired changes and click the 'UPDATE' button at the bottom of the page. It's that simple!

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The Super fast router is an all in one Gateway which combines an ADSL2+ modem, router, firewall, Super G access point and 4-port switch all in one unit. It is easy to set-up. Smart Wizard gets you up and running in less than 5 clicks. Super G wireless capability increases speed and range to let you download large files, video conference, and distribute and play high-quality digital movies, photos, and MP3s. An integrated switch directly connects four computers and/or printers.

- Combines modem, router, switch, Super G and 802.11g access point, and SPI True Firewall
- Up to 10X faster than 802.11b with twice the range
- True Firewall with Stateful Packet Inspection (SPI) & Intrusion Control, Denial of Service (DoS), Virtual Private Network (VPN) pass-through
- Works with Super G 802.11g & 802.11b ADSL 2/2+

T6177



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- **Colour Flatbed Scanner:** 19,200 dpi class (interpolated), scan to key
- **Colour Fax:** 33.6kbps modem, up to 35 page ADF, up to 400 pages out of paper reception
- PC-Fax, sends and receives faxes through Windows, sends faxes through Mac
- Colour Scanner, 2400 dpi (interpolated), OCR software, editor software, scan to key
- 1 year limited warranty

T6169

brother At your side

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The Samsung X60 introduces itself with the latest advancements in computing including the brand new Intel Centrino Duo Mobile Technology, 15.4" widescreen and everything wireless. Take advantage of the increased efficiency of an Intel Core Duo Processor, with dual core technology accelerating optimised programs to almost twice the speed.

- Intel Core Duo T2300 1.6GHz Processor
- 2x512MB DDR2 RAM
- 80GB* hard drive
- 15.4" WXGA Gloss Display
- DVD SuperMulti Dual Layer Drive
- Wireless LAN 802.11a/b/g
- Bluetooth
- Remote control
- Weighs 2.5kg
- Solid magnesium casing
- Windows XP Professional
- 3 year on site warranty



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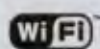
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ULTRA SLIM AND ULTRA SLICK - SAMSUNG X1

Samsung X1 mobile Centrino notebook is the ultimate for mobile users providing the functionality of a 15" notebook at the weight of a standard 12" notebook, and packed with unique AV features. Weighing in at a very portable 1.7kg, with a slick innovative ergonomic keyboard design, remote control to navigate your media player and PowerPoint slides, and top loading optical drive, all for your added convenience. The X1 is more than just a notebook!

- Intel Pentium-M 753 ULV 1.2GHz Processor
- 2x256MB DDR2 RAM
- 60GB hard drive
- 14.1" WXGA Display
- Top loading DVD Dual Layer Drive
- Wireless LAN 802.11a/b/g
- Remote control
- Bluetooth
- 4-in-1 Media Reader
- Weighs 1.7kg
- Windows XP Professional
- 3 year on site warranty



14.1" WIDESCREEN

Rent* \$31.55/wk

\$2999

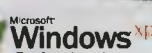
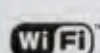
SAMSUNG Q35 COMPACT ALL-IN-ONE

WITH INTEL DUAL CORE
TECHNOLOGY

THE BEAST WITHIN

Want grunt without the added weight? No longer are you required to sacrifice performance because of size, the Samsung Q35 is equipped with the latest Intel Centrino Duo mobile technology and packed with the all the wireless connectivity. At 1.8 kg with a DVD dual layer, 80GB hard drive and offering over 6hrs battery life, don't let this compact design fool you; this beast is very well disguised!

- Intel Core Duo T2300 1.6GHz Processor
- 2x256MB DDR2 RAM
- Removable 80GB hard drive
- 12.1" WXGA Display
- DVD SuperMulti Dual Layer Drive
- Wireless LAN 802.11a/b/g
- Bluetooth
- Up to 6 hour battery life
- Weighs 1.89kg
- Windows XP Professional
- 1 year on site warranty



NEW BONUS CORDLESS LASER MOUSE, CARRY BAG & 512MB USB KEY

12.1" WIDESCREEN

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T5514

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SAMSUNG MP3 PLAYERS

SAMSUNG YP-U1 SERIES MP3 PLAYERS

Music just doesn't get more portable than this! The slim YP-U1 features a foldable USB plug, a 4 line LCD screen with 128 x 64 resolution allowing easy navigation and also functions as a mass storage device.

The rechargeable battery gives up to 13 hours playback time and can be used to record voice memos.

The YP-U1 is perfect for any on the go user who wants to carry both their files and music with them at all times.

FEATURES:

- Up to 1GB storage capacity
- USB 2.0 capability
- Voice recording
- Up to 13 hours playback time
- 4 line, multi-language LCD screen
- Supports MP3, WMA, WAV and Ogg files

While stocks last.



S9200	512MB BLACK (YP-U1X)	\$119¹
S9201	1GB WHITE (YP-U1Z)	\$169¹

SAMSUNG YP-F1 SERIES MP3 PLAYERS

The YP-F1 with its fashionable design let's you wear the player as a necklace or just clip it anywhere on to your clothing. Change covers to be different, whenever you want to (Samsung provides three face plates included in standard packaging).

FEATURES:

- 512MB or 1GB storage capacity
- USB 2.0 capability
- FM radio and FM record
- Voice recording
- Up to 10 hours playback time
- Approximately 240 songs in WMA format or 120 songs in MP3 format (for 512MB model)
- Approximately 480 songs in WMA format or 240 songs in MP3 format (for 1GB model)

While stocks last.



S9194	512MB (YP-F1X)	\$159¹
S9195	1GB (YP-F1Z)	\$199¹

20GB MULTIMEDIA PLAYER



YH-J70S

The YH-J70S is your multimedia jukebox, with capacity for 100 hours of video or 9,600 songs in WMA format (4,800 in MP3 format). It features a stunning 260,000 colour screen, games (including Tetris and Othello) and a G Sensor system to protect against hard drive damage.

S9198 BLACK **\$446**

1GB MOBILE ALL-IN-ONE ENTERTAINMENT PLAYER



YP-T8Z

Samsung offers an all-in-one entertainment player that offers the ability to enjoy music, videos, photo albums, e-books, motion detecting games, USB host, mass storage and much more wrapped in a stylishly hip package.

S9197 BLACK **\$299**

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WHY SAMSUNG...?

Zero Pixel Defect

Samsung's Zero Pixel Defect policy provides for warranty replacement if any pixel defect is discovered during the monitor's 3 year warranty period.



MagicTune™



Included with all Samsung LCD screen's is Samsung's MagicTune™ software. MagicTune™ allows you to quickly and easily make display adjustments using your mouse rather than through an onscreen menu. MagicTune™ features include colour calibration, brightness/contrast, geometry adjustment and remote asset management.

MagicColor



Samsung MagicColor will automatically optimise the colours onscreen depending on the content - works great with games, business graphics and displaying accurate skin tones in photos.

MagicBright



Samsung MagicBright provides different brightness levels depending on the application - settings include Text, Internet, Entertain and User Adjust.

*RENTSMART

The figures quoted are based on a per week basis over 3 years. Terms and conditions apply. For details see rentsmart.ht.com.au.

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17" LCD MONITOR



740N - ANALOGUE

- Response time: 8ms
- Maximum resolution: 1280 x 1024
- Contrast ratio: 600:1
- Interface: Analogue
- Ultra narrow screen bezel
- 3 year on site exchange[^]

[^]Only available while stocks last.

S9509 BLACK ¹

\$379

S9511 SILVER ¹

\$379

19" LCD MONITOR



920N - ANALOGUE

- Response time: 8ms
- Maximum resolution: 1280 x 1024
- Contrast ratio: 700:1
- Interface: Analogue
- Stylish design with ultra-narrow screen bezel
- 3 year on site exchange and zero dead pixel policy[^]



T3827 SILVER

\$479

20" LCD MONITOR



204B - ANALOGUE/DIGITAL

- Response time: 5ms
- Maximum resolution: 1600 x 1200
- Contrast ratio: 800:1
- Interface: Analogue / Digital
- Height adjustable with pivot and swivel stand
- 3 year on site exchange and zero dead pixel policy[^]

Rent* \$10.63/v

T4409 BLACK

\$949

T4408 SILVER

\$949

Rent* \$10.63/v

19" WIDESCREEN LCD MONITOR



940MW - ANALOGUE/DIGITAL

- Response time: 8ms
- Maximum resolution: 1440 x 900
- Contrast ratio: 700:1
- Analogue / Digital interface with multiple inputs
- Wide format viewing with HDTV Ready
- Built in TV tuner and multimedia speakers
- 3 year on site exchange and zero dead pixel policy[^]



Rent* \$8.95/v

T3189 SILVER

\$799

[^]Please contact Samsung Electronics Australia on 1300 362 603 or email: monitor.service@samsung.com for full Terms and conditions.



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APPLE IPOD VIDEO

First, iPod put music in your pocket. Now it puts on a show. With support for up to 15,000 songs and up to 150 hours of video on a 2.5" QVGA color display, iPod gives you the ultimate music experience — sight and sound — in a lighter, thinner design. Available in classic white and dramatic black.

Holds up to 15,000 songs¹ and full-colour album art
Bright 2.5", 320 x 240 pixel TFT display
Up to 20 hours of battery life⁴
Holds up to 25,000 photos²
Holds up to 150 hours of video³
Apple click wheel
Accessory-compatible dock connector
Dock works with the new Apple remote
Syncs contacts, calendars and to-do lists
For Mac and Windows

Song capacity is based on four minutes per song and 128Kbps AAC encoding.
Photo capacity is based on iPod-viewable photos transferred from iTunes.
Video capacity is based on 4 minutes per H.264 750Kbps video combined with 128Kbps audio.
Up to 20 hours of battery life refers to 60GB model and music playback. Rechargeable batteries have a limited number of charge cycles and may eventually need to be replaced. Battery life and number of charge cycles vary by use and settings. See www.apple.com.au/batteries for more information.



Rent* \$6.70/wk

T1569 30GB WHITE **\$449**

T1577 60GB WHITE **\$598**

Rent* \$6.70/wk

T1576 30GB BLACK **\$449**

T1578 60GB BLACK **\$598**

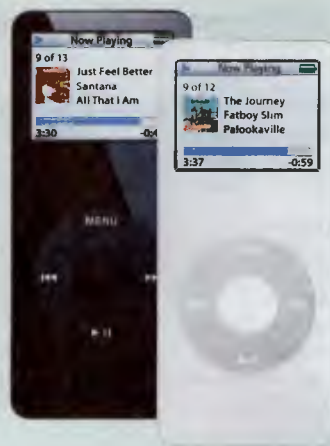
APPLE IPOD NANO

- Up to 1,000 songs⁶ or 25,000 photos⁷
- Just 0.27 inches thin and 1.5 ounces
- Vivid, backlit color display
- Up to 14 hours of battery life⁵
- Available in white or black
- For Mac and Windows

⁵ Rechargeable batteries have a limited number of charge cycles and may eventually need to be replaced. Battery life and number of charge cycles vary by use and settings. See www.apple.com/batteries for more information.

⁶ Music capacity is based on 4 minutes per song and 128Kbps AAC encoding. 1,000 song capacity refers to 4GB Nano model. 1GB = 1 billion bytes; actual formatted capacity less.

⁷ Photo capacity is based on iPodviewable photos transferred from iTunes.



S9613 2GB WHITE **\$299**

S9616 4GB WHITE **\$359**

S9614 2GB BLACK **\$299**

S9615 4GB BLACK **\$359**

ITUNES MUSIC CARDS



Give an iTunes Music Card to the music lovers in your life and let them re-discover old favourites or keep up with the hottest hits. With the prepaid card, they can purchase songs from the #1 music download store and listen to them anywhere with iPod or on their computers with iTunes for Mac or Windows.

To redeem iTunes prepaid cards:

- Download iTunes for Mac or Windows at www.itunes.com
- Open iTunes and click Music Store
- Click Prepaid Cards
- Enter the code printed on the attached card when requested
- Download your songs. Enjoy!

T0782 \$20 CREDIT **\$20**

T0783 \$50 CREDIT **\$50**

T0784 \$100 CREDIT **\$100**

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TECRA A7
POWERFUL, DESKTOP
REPLACEMENT

Stunning array of performance features includes Intel Core Processor, advanced docking capabilities and easy connectivity options with Toshiba ConfigFree. Perfectly suited to both the home and office.

- Intel Core Duo T2300 1.6GHz Processor
- 512MB DDR2 RAM
- 60GB hard drive#
- 15.4" WXGA Wide screen
- DVD SuperMulti double layer drive
- ATI Mobility Radeon X1600 w/ 128MB dedicated VRAM
- WiFi a/b/g & Bluetooth 2.0
- TPM & Finger Print Security
- Windows XP Professional



Rent* \$25.09/wk

A8714 **\$2,349**

Also available in Core Duo T2400 1.8GHz, 512MB RAM, 100GB# HDD, and 15.4" WXGA+ screen

Rent* \$31.34/wk

A8725 **\$2,979**

*RENTSMART

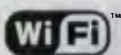
The figures quoted are based on a per week basis over 3 years. Terms and conditions apply. For details see rentsmart.ht.com.au.

PLEASE NOTE:

All purchases subject to terms & conditions and returns policy. Delivery charges may apply. Not all items stocked in store but available for pick-up/delivery.

SATELLITE PRO L20

The Satellite Pro L20 is a reliable, cost effective desktop replacement notebook that eases your entry into the world of mobile computing. Offering a choice of the latest Intel Centrino mobile technology, including the Pentium M processor for exceptional mobile performance or the Celeron M processor for the perfect balance between mobile processing technology and exceptional value.



BOTH MODELS INCLUDE (unless otherwise stated):
256MB DDR2 RAM, 40GB hard drive#, 15" XGA screen, WiFi b/g, Microsoft OneNote



L20

- Celeron M 360 1.4GHz
- DVD/CD-RW Combo Drive
- Windows XP Home



Rent \$11.71/wk

S9748

\$1,045

L20

- Pentium M 740 1.7GHz
- DVD SuperMulti + Double Layer Drive
- Windows XP Professional



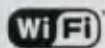
Rent \$16.01/wk

S9669

\$1,429

ULTRA PORTABLE AND TABLET SERIES

Ready to work when and where you are, the Portégé and Libretto series delivers an advanced combination of ultra portability and expansion capability. Behind the compact design lies a power base ready to maximise performance with Intel Pentium M processors, large memory, and built-in wireless communication to keep you well connected.



Portégé M400

ALL MODELS INCLUDE (unless otherwise stated):
2x256MB RAM, 60GB hard drive#, 56K V.90 & 10/100 LAN, WiFi a/b/g, Bluetooth, 3 year warranty and Windows XP Professional

LIBRETTO U100

- Pentium M 753 1.2GHz ULV
- 512MB RAM
- 7.2" WXGA TFT display
- DVD SuperMulti Double Layer (with Dock)
- Weight: from 791g
- WiFi b/g
- 1 year warranty

Rent* \$34.89/wk

E5927

\$3,349

PORTÉGÉ R200

- Pentium M 753 1.2GHz ULV
- 12.1" XGA TFT display
- No optical drive
- Up to 5 hrs battery life
- Weight: from 1.3kg

Rent* \$34.71/wk

S9625

\$3,299

PORTÉGÉ M400 TABLET

- Intel Core Solo T1300 1.6GHz
- 512MB DDR2 RAM
- 12.1" XGA TFT display
- Optional internal optical drive available
- Bluetooth Antenna
- Weight: from 2kg

Rent* \$32.61/wk

T5498

\$3,099

TECRA M4 TABLET

- Pentium M 760 2GHz
- 512MB DDR2 RAM
- 80GB hard drive#
- 14.1" SXGA+ TFT display
- DVD SuperMulti Double Layer
- Weight: 2.8kg
- XP Professional Tablet

Rent* \$39.57/wk

T4944

\$3,799

*Accessible capacity of hard drive may be less due to pre-installed software and recovery partition.

TOSHIBA

harristechnology



Notebooks

LEADER IN NOTEBOOK TECHNOLOGY

TECRA A3X SPECIALS

The Tecra A3X is an entry level, corporate notebook, offering outstanding quality and superior mobile performance, all at a compelling price. Its rich blend of features makes it a truly capable and cost effective desktop replacement solution for the mobile business user. Featuring the NEW DVD SuperMulti Double Layer that supports recordable DVDs featuring two separate recording layers that can store 8.5GB of data.



- A3X**
- Intel Pentium M 740 1.7GHz processor
 - 512MB DDR2 RAM
 - 60GB* hard drive
 - 15" XGA TFT (1024 x 768) screen
 - DVD SuperMulti Double Layer drive
 - 56k V.92 modem and LAN



- Wireless LAN 802.11a/b/g
- PCMCIA: 1 x Type II
- Weight: 2.7kg
- Battery life up to 4 hours
- Microsoft XP Professional
- 12 months warranty

Rent* \$19.04/wk

\$1,699

S9161

HUGE VALUE MOBILE PACK

ALL YOU NEED TO GET MOBILE!



4 GREAT BUNDLED ITEMS¹

Targus Messenger Bundle includes a Vibe 15.4" messenger case, retractable mouse, 4 port USB 2.0 hub and 128MB flash drive!



- Wireless LAN 802.11a/b/g
- Up to 4 hours of battery life
- Weight: 2.7kg
- Windows XP Professional
- 12 months warranty

Rent* \$24.08/wk

\$2,149

S7643

Accessible capacity of hard drive may be less due to pre-installed software and recovery partition.

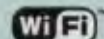
toshiba.ht.com.au

SATELLITE PRO P100

The Satellite Pro P100 is the high-end multimedia notebook built for business offering very high quality graphics and audio capacity. Featuring Intel Core Duo Processor enabling enhanced performance and improved battery life. It incorporates Toshiba EasyGuard to secure, protect, connect and optimise your investment.



- Intel Core Duo Processor T2400 1.8GHz
- 17" TruBrite WSXGA+ (CSV)
- 512MB DDR2 RAM
- 100GB* hard drive
- DVD SuperMulti Double / Dual Layer
- WiFi 802.11a/b/g and Bluetooth 2.0
- Microsoft Windows XP Professional



Rent* \$34.71/wk

\$3,299

A7575

*RENTSMART

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BUSINESS SOLUTIONS AT AN AFFORDABLE PRICE

ACER PROJECTORS

ACER WIDESCREEN DLP PROJECTOR



PH110

- Brightness: 1100 ANSI-Lumens
- Resolution: 854 x 480
- Contrast ratio: 2000:1
- Multiple inputs
- 2 year projector warranty

Rent* \$11.42/wk

A8732

\$1019

ACER XGA DLP PROJECTOR



PD125

- Brightness: 2000 ANSI-Lumens
- Resolution: XGA 1024 x 768
- Contrast ratio: 2000:1
- Multiple inputs
- 2 year projector warranty

Rent* \$17.92/wk

A8731

**\$1599**

*RENTSMART

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HOT PC DEAL

The AcerPower F5 PC comes packed with the latest technologies making them the perfect choice for multimedia applications!



Image for illustration purposes only

AcerPower F5 PENTIUM 4 PC

- **Processor:** Intel Pentium 4 3.06GHz (1MB Cache, 533MHz)
- **Memory:** 1024MB DDR2-SDRAM
- **Hard Drive:** 160GB* (7200RPM) SATA
- **Optical Drive:** Dual Layer 16x DVD Writer

- Speakers included
- Keyboard & mouse included
- **Operating system:** Windows XP Professional
- **Warranty:** 1 year limited onsite

Rent* \$11.19/wk

T3142

\$999

ACER 20" LCD TV



- Screen size: 20" / 51cm
- Maximum resolution: 800 x 600
- Brightness: 450 cd/m²
- Contrast ratio: 500:1
- Integrated speakers
- Multiple inputs
- Warranty: Limited 3 years

Rent* \$8.95/wk

A8719

\$799

ACER 26" WIDESCREEN LCD TV



- Screen size: 26" / 66cm
- Maximum resolution: 1280 x 768
- Brightness: 450 cd/m²
- Contrast ratio: 600:1
- Integrated speakers
- Multiple inputs
- Warranty: Limited 3 years

Rent* \$14.56/wk

A8728

\$1299

*Accessible capacity of hard drive may be less due to pre-installed software and recovery partition.



These products are for delivery only. Delivery charges apply. See page 63 for details.

HOT ACER NOTEBOOK DEALS

TRAVELMATE 2433WLCi WITH WIDESCREEEN

The TravelMate 2433 is the perfect partner for enhancing your efficiency and success with its combination of robust processing power, graphics capabilities, communications and dependable design.

- Intel Celeron M 370 1.5GHz
- 256MB DDR2 RAM
- 15.4" WXGA wide screen
- 60GB hard disk*
- DVD±RW Dual Layer Drive
- 4 x USB 2.0 ports
- Modem / LAN
- WiFi 802.11g with SignalUp Technology
- Windows XP Professional



A7458

**NEW
EXCLUSIVE
BONUS**
256MB RAM
(not installed)
& BAG



Rent* \$13.43/wk

\$1199

EXCLUSIVE TO HARRIS TECHNOLOGY!

TRAVELMATE 4062WLMi WITH WIDESCREEEN

Work with freedom and experience a brand new approach to productivity! The new TravelMate 4062 combines Intel Centrino technology featuring a comprehensive feature set to offer one of the most practical notebooks available today.

- Intel Pentium M 740 1.7GHz
- 256MB DDR2 RAM
- 15.4" WXGA wide screen
- 60GB hard disk*
- DVD±RW Dual Layer Drive
- 56Kbps modem
- 10/100 LAN
- WiFi 802.11g with SignalUp Technology
- Up to 5 hours of battery life
- Windows XP Professional

* Limited Stock



T3774

BONUS
256MB RAM
(not installed)
& BAG



Rent* \$17.92/wk

\$1599

BOOST YOUR WIRELESS CONNECTION WITH ACER SIGNALUP

A breakthrough that boosts wireless performance by a minimum of 25%. Acer technology provides a more stable signal with higher quality wireless both outdoors and in difficult indoor environments.



* Accessible capacity of hard drive may be less due to pre-installed software and recovery partition.

**WITH INTEL DUAL
CORE TECHNOLOGY**



**BONUS
CARRY
BAG**

TRAVELMATE 4202LMI

The TravelMate 4202 is well balanced to optimise your productivity and amplify your success, combining solid performance with wide ranging functionality

- Intel Core Duo T2300 1.6GHz
- 512MB DDR2 RAM
- 15" XGA screen
- 80GB hard disk*
- DVD±RW Dual Layer Drive
- 4 x USB 2.0
- Modem / LAN
- WiFi 802.11g with SignalUp Technology
- Up to 5 hours of battery life
- Windows XP Professional



Rent* \$21.28/wk

T5012

\$1899

*RENTSMART

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PLEASE NOTE:

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Logitech

DESIGNED TO MOVE YOU

CORDLESS MINI OPTICAL MOUSE

Small enough to fit in your bag. The plug-and-play mini receiver snaps into the mouse for easy transport while shutting it off. A battery indicator light tells you when power is low. USB. 3 year warranty.

T5635

\$45**V270 CORDLESS NOTEBOOK MOUSE WITH BLUETOOTH**

Works without a receiver and connects instantly to your Bluetooth enabled notebook, providing up to 30 feet of cordless range. Power-saving modes, battery indicator light, and an on/off switch manage power wisely. Incredibly smooth tracking for maximum productivity while traveling.

T3577

Bluetooth

\$74**V-20 NOTEBOOK SPEAKERS**

The USB port provides power and digital quality audio. Innovative headroom technology and an active/pressure driver combination maximise bass response in a lightweight, portable design. Travel case included.

S8957

\$119**QUICKCAM FOR NOTEBOOKS PRO**

True 1.3 MP sensor with RightLight™ technology provides sharp images even in dim light. RightSound™ ensures clear, echo free audio with or without a headset.

T5700

**\$175****PLEASE NOTE:**

All purchases subject to terms & conditions and returns policy. Delivery charges may apply. Not all items stocked in store but available for pick-up/delivery.

CORDLESS DESKTOP MX 3000

The Cordless Desktop® MX 3000 Laser offers amazing precision, and superior comfort. With an incredibly accurate laser mouse, plus sleek media and document navigation controls, including instant image zoom, you're in complete control. All with world class comfort. Moreover, advanced power management means ultra-long battery life, while SecureConnect™ technology creates premium wireless performance.

S8950

\$149**QUICKCAM PRO 5000**

Designed to provide a more personal communication experience, the Logitech QuickCam Pro 5000's exclusive technologies ensure sharp video and clear audio. Logitech RightLight™ technology provides optimum video even in dim lighting while RightSound™ technology eliminates annoying echo and allows natural conversations.

T3585

\$142**HARMONY 880 UNIVERSAL REMOTE**

Home entertainment made simple. The stylish Harmony 880 Advanced Universal Remote, supplied with a charging station, puts you in control of your entire audio-video system with just one button press. With instant and free access to our worldwide database of infra-red codes, you can control pretty much anything. 1 year warranty.

S9725

\$295

These products are for delivery only. Delivery charges apply. See page 63 for details.

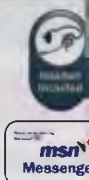
CORDLESS DESKTOP MX 5000 BLUETOOTH LASER

Bluetooth



The Cordless Desktop® MX 5000 Laser is the world's first smart desktop. A unique LCD keyboard display lets you instantly navigate media playlists or online radio stations, view time/date, and more. You'll also enjoy smart power management, including rechargeable Laser mouse, advanced Bluetooth wireless capabilities and awesome touch-sensitive media controls.

T3579

\$269**QUICKCAM FUSION**

Logitech® QuickCam® Fusion™ provides true 1.3 mega-pixel sensor quality with Logitech RightLight™ Technology combined with high quality audio via a built-in microphone and Acoustic Echo Cancellation (AEC) and noise reduction technology for hands free/headset free VideoCalling. Its monitor front design also provides improved eye-to-eye contact. USB 2.0 HS certified.

T3586

\$179**Z-5450 WIRELESS SPEAKERS**

Immerse yourself in clutter-free, high-fidelity digital surround sound with Logitech's THX-certified, 315 watt Z-5450 Digital 5.1 speaker system with dual wireless rear speakers. The Digital SoundTouch™ Control Center supports Dolby® Digital, DTS®, and DTS® 96/24 soundtracks and includes digital and analog inputs for connecting DVD players, PCs, video game consoles, MP3 players, and more.

T4773

**\$749**

GET MOBILE...GET TARGUS

5 BUTTON OPTICAL TRAVEL MOUSE



Ideal for travel, this compact optical mouse with USB retractable cable is the *world's smallest 5 button mouse!*

40655

\$39

WIRED OPTICAL NOTEBOOK MOUSE



Ideal for travel and desktop use, this ergonomic optical mouse with USB retractable cable has a 3 button scroller wheel design - suitable for left and right hand users.

C9388

\$39

WIRELESS OPTICAL NOTEBOOK MOUSE



Utilising wireless RF technology coupled with 800dpi resolution and rechargeable USB cable this product provides uncluttered desktop use with accuracy and precision data input.

36187

\$59

COMPACT USB KEYBOARD



- Compact ¾ keyboard
- Standard sized keycaps
- Preprogrammed internet and email hot keys
- Ideal for use with external keypad

T4213

\$28

INTERNET MULTIMEDIA KEYBOARD



- 11 quick access hot keys
- 4 multimedia hot keys
- Slim keyboard helps reduce finger fatigue and takes up less desktop space
- Mute key and volume dial on keyboard

T3980

\$38

USB MINI KEYPAD WITH HUB



- 19 key with 'backspace' and '000' keys
- Slim, low profile design
- Built in 2 port USB hub
- Plug and play capability

S1811

\$41

WIRELESS 2.4GHz PRESENTER



Wireless 2.4GHz presenter is a multi-tasking wireless device which offers mouse capability and presentation controls with a built in laser pointer.

T3495

\$99

WIRELESS OPTICAL MOUSE / PRESENTER



Portable 2.4GHz presenter with laser pointer function also is an optical wireless mouse - 15m range. Has on/off switch for preserving battery life.

M9225

\$129

WIRELESS MULTIMEDIA PRESENTER



4-in-1 wireless, 2.4GHz presenter with trackball mouse, laser pointer, multimedia and presentation controls all in one - 15m range.

P5884

\$149

LEATHER CASE AND PRESENTER



Includes:

- 15.4" leather case
- Silver wireless presenter

20376

\$169

NOTEBOOK ESSENTIALS BUNDLE



Includes:

- Includes 15.4" notebook case
- Wired mini optical mouse
- 4 port mini USB 2.0 hub

40272

\$79

LIFESTYLE MESSENGER BUNDLE



Includes:

- Vibe 15.4" messenger case
- Retractable mouse
- USB 2.0 4 port hub
- **BONUS** 128MB flash drive - while stocks last

A5088

\$119

PLEASE NOTE:

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DELIVERY ONLY

These products are for delivery only. Delivery charges apply. See page 63 for details.

VAIO NOTEBOOKS

SONY NOTEBOOKS



NEW!
Up to 8.5hrs
Battery
Life

VGNTX27GPB

The latest TX27GP redefines mobility! Besides the impressive specifications, the new TX27GP features a robust carbon fiber chassis that's resistant to bumps and knocks. Essential for business travellers who carry their notebooks everywhere. Carbon fibre is as strong as steel yet much lighter.

- Carbon fibre chassis
- Built-in DVD±RW Dual Layer Drive
- 11.1" Wide XGA Clear Bright LCD
- Pentium M ULV 753 1.2GHz
- 1GB RAM
- 60GB HDD*
- WiFi and Bluetooth 2.0+EDR
- Weighs just 1.25kg
- Instant AV
- Sony multimedia software pack
- Windows XP Professional



Rent* \$38.53/wk
\$3,699

13688

SOFT CARRY POUCH (TX series)
T3353 **\$49**

PORT REPLICATOR (TX series)
38549 **\$359**

***RENTSMART**

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PLEASE NOTE:

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SECURE BUSINESS MODELS

**VGNBX168GP**

- Magnesium alloy chassis
- 15.4" Wide XGA Clear Bright LCD
- Pentium M 760 2GHz
- 512MB RAM, 60GB* HDD
- WiFi and Bluetooth 2.0+EDR
- DVD±RW Dual Layer Drive
- Removeable drive expansion bay
- Motion eye camera
- Security features
- Windows XP Professional

Rent* \$26.70/wk

93097

\$2,499**VGNSZ18GP**

- Carbon fibre chassis
- 13.3" Wide XGA LCD
- DVD±RW Dual Layer Drive
- Intel Core Duo T2400 1.8GHz
- 512MB RAM, 80GB* HDD
- Bluetooth
- nVidia GeForce Go 7400
- HDD shock protection
- Wireless LAN 802.11a/b
- Motion eye camera
- Biometric fingerprint protection
- Windows XP Pro

Rent* \$38.53/wk

20464

\$3,699

FE SERIES

With the powerful Intel Centrino Duo Mobile Technology and the new Clear Bright High Colour 15.4" wide LCD screen, this is the perfect business notebook. Conduct business conferences with the integrated Motion eye camera and Bluetooth 2.0+EDR.

**BOTH MODELS INCLUDE (unless otherwise stated):**

Magnesium alloy chassis, DVD±RW Dual Layer Drive, 15.4" Wide XGA Clear Bright LCD, 512MB RAM, GeForce Go 7400 graphics, Wireless LAN 802.11b/g, Bluetooth, Windows XP Professional

VGNFE15GP

- Intel Core Duo T2300 1.6GHz
- 80GB* HDD

Rent* \$24.56/wk

65597

\$2,299**VGNFE18GP**

- Intel Core Duo T2400 1.8GHz
- 100GB* HDD

Rent* \$29.45/wk

20375

\$2,799**VGNSZ15GP**

- Magnesium alloy chassis
- DVD±RW Dual Layer Drive
- 13.3" Wide XGA Clear Bright LCD
- Intel Core Duo T2300 1.6GHz
- 512MB RAM
- 60GB* HDD
- WiFi & Bluetooth 2.0+EDR
- Windows XP Pro

Rent* \$31.55/wk

54209

\$2,999**VGNFJ68GP**

- Magnesium alloy chassis
- DVD±RW Dual Layer Drive
- 14.1" Wide XGA Clear Bright LCD
- Pentium M 750 1.8GHz
- 512MB RAM
- 60GB* HDD
- WiFi 802.11b/g
- Motion eye camera
- Windows XP Pro

Rent* \$22.40/wk

33786

\$1,999

*Accessible capacity of hard drive may be less due to pre-installed software and recovery partition.

SONY®

harristechnology 

Projectors & Cameras

CAPTURE, BURN & DISPLAY WITH SONY

NEW CYBER-SHOT DIGITAL STILL CAMERA

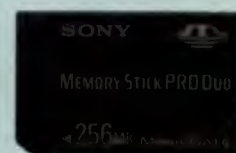


NEW

THE PERFECT DIGITAL CAMERA
FOR VARIOUS LIGHTING
CONDITIONS, ESPECIALLY NIGHT
TIME AND INDOOR PHOTOS

- 6 megapixel
- 3x Optical zoom
- Large 2.5" vibrant colour LCD
- Up to 390 shots per charge
- 32MB internal memory
- Memory Stick Duo slot for increased card capacity
- Includes battery and charger

SONY MEMORY STICK PRO DUO CARDS



Q4033	256MB	\$75
Q4035	512MB	\$107

SONY INTERNAL DUAL LAYER 16X DVD BURNER



DRU810A

- Internal, easy to install EIDE/ ATAPI Interface
- Replaceable black front faceplate included

T3331 **\$113**

SONY EXTERNAL DUAL LAYER 16X DVD BURNER



DRX810UL

- USB2.0 and i.LINK / Firewire connection
- Can be operated in a vertical or horizontal orientation

T3332 **\$235**

*RENTSMART

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T6010 DSCW50S - SILVER **\$479**

LCD PROJECTORS

BRIGHT IMAGES

GENTLE ON THE EYES

NATURAL COLOURS



ULTRA PORTABLE PROJECTOR



WIRELESS MEMORY STICK PROJECTOR



HD READY

- 2000 ANSI-Lumens
- XGA (1024x768) resolution
- Slim (52mm) and stylish design
- Advanced intelligent auto set-up
- Multiple inputs
- Power zoom and focus
- Security password authentication system
- Remote control and carry case supplied
- 2 years limited warranty†

VPLCX20 Rent* \$25.63/wk

S7487 **\$2399**

- 2500 ANSI-Lumens
- XGA (1024 x 768) resolution
- Advanced intelligent auto set-up
- AirShot II wireless connection
- Memory stick slot for presentation without a PC
- Large screen viewing up to 300"
- Security password authentication system
- Remote control and carry case supplied
- 2 years limited warranty†

VPLCX76 - XGA resolution Rent* \$38.01/wk

S6905 **\$3649**

†Warranty conditions apply.

sony.ht.com.au

HP COMPAQ HOT DEALS

PERFECT UPGRADES FOR APRIL

512MB RAM for nx6120/5
L6426 **\$153**

512MB RAM for nx8220
R6676 **\$179**

HP DOCKING STATION

R6661 **\$215**

HP ADVANCED DOCKING STATION

R6662 **\$275**

HP TRAVEL BATTERY

R6672 **\$195**

HP L1706 17" TFT MONITOR

S9519 **\$499**

MICROSOFT OFFICE 2003 BASIC

Purchase a HP notebook and get an OEM Microsoft Office Basic 2003 which includes Word, Excel, and Outlook.

S2164 **\$159**

*RENTSMART

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HP nx6125 - GREAT VALUE FOR POWER!

POWERFUL & FEATURE PACKED WITH 64 BIT PROCESSOR FOR FUTURE UPGRADES

The HP Compaq nx6125 Notebook PC is a smart balance of mobility, affordability and security. At just 2.72kg, this thin and light design features AMD Turion 64 Mobile technology and has an integrated Biometric Fingerprint Sensor, 6-in-1 media reader and spill resistant keyboard.

- AMD Turion 64 ML-37 2GHz 64 bit processor
- 1GB DDR RAM (2x512MB)
- 80GB* hard drive
- ATI X300 graphics with 128MB shared VRAM
- 15" XGA screen
- DVD±RW dual layer burner
- 56K V92 modem and Gigabit LAN
- Wireless LAN 802.11b/g
- 2 x USB 2.0 ports
- HP Biometric fingerprint reader
- 6 in 1 media reader
- Up to 3.5 hours battery life (additional travel battery optional)
- Microsoft XP Professional
- 1 year warranty



15"

**NEW
EXCLUSIVE
GREAT
VALUE!**

Limited Stock!
Only available while stocks last.

Rent \$19.04/wk

\$1,699

HP nx6120 & nx8220 SERIES

PACKED TO PERFORM, PRICED TO PLEASE

The HP Compaq nx6120 and nx8220 Business Notebook are packed with advanced technology features offering solid performance at a surprisingly affordable price. What's more, most models come with wireless connectivity so that you can get the job done effortlessly, wherever your work takes you.



**BONUS
CARRY CASE,
WIRELESS
MOUSE &
256MB USB
KEY ***

*Bonus available from 01/04/06 to 30/04/06 for Pentium M models only. Not available in conjunction with any other offer. Only available while stocks last.

Image for illustration purposes only

MODEL	nx6120	nx6120 ¹	nx6120 ¹	nx8220 ¹	nx8220 ¹
PROCESSOR	Cel-M 360	P-M 740	P-M 740	P-M 750	P-M 760
CLOCK SPEED	1.4GHz	1.7GHz	1.7GHz	1.8GHz	2GHz
RAM	256MB	512MB	512MB	512MB	512MB
HARD DRIVE	40GB*	40GB*	80GB*	80GB*	80GB*
SCREEN	15" XGA	15" XGA	15" XGA	15.4" WXGA	15.4" WSXGA
OPTICAL DRIVE	Combo	DVD±RW+DL	DVD±RW+DL	DVD±RW	DVD±RW
WIRELESS LAN		802.11g	802.11g+BT	802.11a/g+BT	802.11a/g+BT
WARRANTY	1 year	1 year	1 year	1 year	1 year
RENT*	\$13.95/wk	\$19.60/wk	\$22.36/wk	\$24.52/wk	\$28.30/wk
PART NUMBER	R7182	F7734	C7197	F7736	F7733
PRICE	\$1,245	\$1,749	\$1,995	\$2,295	\$2,649

*Accessible capacity of hard drive may be less due to pre-installed software and recovery partition.

HP DESKTOPS

HP DX2150 MICROTOWER PC

- **Processor:** AMD Athlon 64 3200+
- **RAM:** 1GB PC3200 DDR400
- **Hard Drive:** 160GB* SATA (7200RPM)
- **Optical Drive:** 16x DVD±RW LightScribe Drive (Double Layer/Dual Format)
- **Graphics:** Integrated Mirage 1 graphics engine
- **Operating System:** Microsoft Windows XP Professional
- Keyboard and Mouse included
- **Warranty:** 1 year parts, labour and limited on-site

Image for illustration purposes only.



Rent* \$10.07/wk

\$899

T4948

HP DX7200 SLIM TOWER PC

- **RAM:** 512MB DDR2 (667MHz) Synch DRAM
- **Chipset:** Intel 945G
- **Hard Drive:** 80GB* Ultra SATA (7200RPM)
- **Optical Drive:** 16X DVD±RW (LightScribe, Double layer, Dual format)
- **Operating System:** Microsoft Windows XP Professional
- Keyboard and mouse included
- **Warranty:** 3 year parts / 1 year labour and onsite

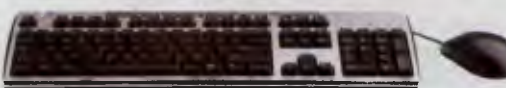


Image for illustration purposes only.

Rent* \$14.33/wk

\$1,279

T0720 DX2000 SLIM TOWER P4 3.0GHz

Rent* \$15.45/wk

\$1,379

T0722 DX2000 SLIM TOWER P4 3.2GHz

*Accessible capacity of hard drive may be less due to pre-installed software and recovery partition.
^Certain restrictions and exclusive conditions apply. Consult HP customer service on 13 13 47 for details.

HP MONITORS



HP L1706 17" MONITOR - ANALOGUE

- Panel Type: 17" Active Matrix TFT
- Brightness: 300 cd/m2
- Contrast Ratio: 500:1
- Resolution: 1280 x 1024
- Warranty: Limited 3 years parts, labor, and on-site service - including backlight^

S9519

\$499



HP L1906 19" MONITOR - ANALOGUE

- Panel Type: 19" Active Matrix TFT
- Brightness: 250 cd/m2
- Contrast Ratio: 500:1
- Resolution: 1280 x 1024
- Warranty: Limited 3 years parts, labor, and on-site service - including backlight^

Rent* \$6.71/wk

\$599

S9396

*RENTSMART

The figures quoted are based on a per week basis over 3 years. Terms and conditions apply. For details see rentsmart.ht.com.au

PLEASE NOTE:

All purchases subject to terms & conditions and returns policy. Delivery charges may apply. Not all items stocked in store but available for pick-up/delivery.



FOR BUSINESSES ON THE MOVE

ORGANISED FUN GETTING IT TOGETHER HAS NEVER BEEN THIS EASY



Meet the **Palm® Z22 organiser**. It's so easy to use, you can get started in a few simple steps. Pick it up. It's small and light. Turn it on. There's a bright colour screen. Appointments, phone numbers, to do lists, and photos - keep it all there.

PALM Z22 HANDHELD ORGANISER

- Organises appointments, contacts, to do lists
- Simple, easy to use
- Bright, colourful screen
- Keeps your information safe
- Compact and lightweight
- Holds hundreds of photos
- 32MB memory¹
- 160 x 160 colour touchscreen display
- 200 MHz processor
- Long-life rechargeable battery

T0851

\$179

¹ 20MB actual storage capacity.

*RENTSMART

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AFFORDABLE WI-FI IS HERE WITH PALM T1X HANDHELD

With built in Wi-Fi and Bluetooth® technology, the **Palm® T1X handheld** is the wireless device you've been waiting for. Browse the web, check email², and see everything on a large colour screen. Work on your Word, Excel, and PowerPoint files³ - or have some fun and listen to MP3s⁴. It's anything but business as usual.

PALM T1X HANDHELD

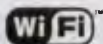
- Built-in Wi-Fi and Bluetooth wireless technology
- High resolution 320 x 480 screen, rotates to landscape or portrait
- 128MB¹ flash memory keeps your information safe
- Browse the web and send email²
- View photos and videos, play MP3 files and podcasts⁴
- View, edit, and create Word, Excel and PowerPoint compatible files³
- MultiMediaCard, SD, and SDIO expansion card compatible
- Intel 312MHz processor

¹ 100MB actual storage capacity.

² Within wireless service coverage area only. Bluetooth functionality requires compatible Bluetooth device; web and email require data plan and an ISP, all sold separately. Some Wi-Fi hotspots require fee for usage. Microsoft Exchange Server 2003 or VPN may be required.

³ PowerPoint support for Macintosh is view only.

⁴ Expansion card required for Macintosh, sold separately. Internet download may be required.



T0850

\$499

STAY CONNECTED WITH PALM TREO 650

The **Treo 650 smartphone** from Palm makes it easier than ever to stay connected. It simplifies your life by combining a compact mobile phone with email, an organiser, messaging and web access. There's also Bluetooth technology so you can connect wirelessly to other Bluetooth devices, a built-in MP3 player, a digital camera that captures video, and a vibrant colour screen that brings everything to life. And it supports GSM EDGE networks, a worldwide standard for high-speed wireless data communications.

PALM TREO 650 COLOUR SMARTPHONE

- Processor: Intel XScale 312MHz
- Main Memory: 22MB user accessible RAM
- Display: 320 x 320 TFT touch screen
- Audio: Built In (stereo adaptor sold separately)
- Camera: VGA (640x480) w/ 2x Zoom
- Input Device: Stylus, 5 way navigation button, QWERTY keyboard
- Expansion: SD/MMCard Slot with SDIO
- Communication: GSM/GPRS/EDGE 850/900/1800/1900 World Phone, Infrared, USB cable, Bluetooth



R3503

Rent* \$10.07/w

\$899

¹ Bonus accessories are hard bundled and available only while stocks last.

MICROSOFT HARDWARE

WIRELESS LASER DESKTOP 6000



- Wireless Freedom - no cords or recharging station!
- High Definition Wireless mouse with 4 way scrolling for laser-smooth precision
- Comfort curve design keyboard
- Get a closer look - zoom in quickly and accurately with the intuitive zoom slider

T0468

\$199

WIRELESS NOTEBOOK LASER MOUSE 6000



- Accuracy and control of advanced laser technology
- Easily enlarge and edit details with the new magnifier
- 4 way scrolling for greater efficiency and comfort
- Plug in the snap-in receiver when you're ready to work, then snap it into your mouse when you travel, preserving battery life

T0467

\$99

COMFORT OPTICAL MOUSE 3000



- Scroll through documents and web pages quicker and easier with this ergonomic, 4 button mouse
- High Definition Optical Technology
- Magnifier - point and click to enlarge and edit
- Tilt Wheel Technology for 4 way scrolling
- 4 programmable buttons
- Comfort designed for either hand

T0613

\$35

OPTICAL DESKTOP ELITE FOR BLUETOOTH



- Top performance, advanced technology and ergonomic comfort
- Wireless Freedom - no tangled cords and clutter!
- Wireless optical mouse with tilt wheel gives you worry free accuracy
- Connect your computer to a host of Bluetooth devices
- New optical technology helps extends battery life

P7009

\$259

NATURAL ERGONOMIC KEYBOARD 4000



- Advanced ergonomic design
- More direct key strikes for less finger effort with the gull-wing design
- Reverse slope optional palm lift
- Get a closer look - zoom in quickly and accurately with the intuitive zoom slider

T0577

\$79

COMFORT CURVE KEYBOARD 2000



- Ultra-thin profile keys
- Comfort curve keyboard layout
- Internet access with the touch of a button
- Easy set-up and use - just plug it in and start typing
- MultiMedia keys
- Spill-resistant design

T0464

\$39

WIRELESS OPTICAL MOUSE 3000



- Scroll horizontally as well as vertically through documents and web pages
- Longer battery life
- Ergonomic designed comfort for either hand
- 3 programmable buttons for your convenience

K8218

\$69

WIRELESS OPTICAL MOUSE 5000



- High definition optical technology
- Tilt wheel technology
- Ergonomic design
- 5 programmable buttons
- Longer battery life

S9536

\$79

WIRELESS INTELLIMOUSE EXPLORER FOR BLUETOOTH (USB)



- Tilt wheel technology
- Microsoft optical technology delivers superior tracking with precision accuracy
- Features 2 extra side buttons that let you move forward and back in your Internet browser

P7006

\$149

PLEASE NOTE:

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SEAGATE EXTERNAL HARD DRIVES

SEAGATE COMPACT FLASH TYPE II HARD DRIVES



These high-capacity, 1" photo hard drives are the perfect storage solution for professional and enthusiast photographers. Available in 4GB and 8GB capacities, you can quickly store thousands of high resolution photos without changing the card. With their rugged design and world-renowned Seagate quality, you can count on data integrity and protection from drops and falls.

- Ultra-fast 3600-RPM drives with 2MB cache
- Built to last, inside and out, so the drive and data are protected
- Designed for digital cameras with a CF+ Type II media slot
- Compatible with a wide and growing range of FAT32-formatted digital cameras
- 3600 RPM drives with 2MB cache consistently deliver the high performance you need
- Worry-free, 1 year warranty covers all parts and labour

T3725 4GB **\$249**

T3726 8GB **\$449**

PLEASE NOTE:

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EXTERNAL HARD DRIVE 3.5"
7200 RPM FIREWIRE/USB 2.0

HIGH CAPACITY, AMAZING PERFORMANCE

You can safely store business files, movies and photos, the latest games, your favourite music and more. And the interlocking design lets you securely expand your Seagate storage.

ENGINEERED FOR HIGH PERFORMANCE

7200 RPM drive with 8MB cache and whisper quiet motor lets you effortlessly store and work with massive amounts of data.

BUILT FOR SAFETY AND SECURITY

Seagate hard drives are safeguarded by built-in self monitoring technology that continuously checks your hard drive for data safety and drive performance. SeaTools diagnostic software is included.

WORRY FREE, 1 YEAR WARRANTY

Warranty covers all parts and labour.



DRIVE SPECIFICATIONS

- 8MB cache
- 350 Gs non-operating shock resistance
- 7200 RPM
- Mac and PC compatible

R3677 200GB (USB 2.0+FireWire)

\$309

R3678 300GB (USB 2.0+FireWire)

\$379

R3679 400GB (USB 2.0+FireWire)

\$509

PORTABLE DRIVE 2.5"
EXTERNAL 5400 RPM USB 2.0

Enjoy easy storage and access of large digital music, photo, video, data and multimedia files both on the desk and on the go. Seagate hard drives are safeguarded by built-in self monitoring technology that continuously checks your hard drive for data safety and drive performance. SeaTools diagnostic software is included.

- 2MB cache (40GB) / 8MB cache (100GB)
- 5400 RPM
- 5000 Gs non-operating shock resistance
- Mac and PC compatible
- Warranty covers all parts and labour

R3680 40GB

\$215

R3682 100GB

\$349

EXTERNAL HARD DRIVE 3.5"
7200 RPM USB 2.0

Protect valuable data and digital memories for years to come! These easy to use external drives are a safe and affordable way to protect everything from business files to your treasured digital memories.

- Easy storage and access for large digital music, photo, video, personal data and multimedia files
- Large-capacity drives extend the life of your computer by providing extra storage space.
- Fast 7200-RPM high-performance drives with a 2MB cache to effortlessly handle large amounts of data
- Whisper-quiet and cool operation
- 1 year warranty covers all parts and labor
- Free technical support even after the warranty ends

T6057 120GB

\$179

STORE YOUR WORLD IN OURS

ULTRA II SECURE DIGITAL PLUS CARDS

The newest addition to the ultra family is the innovative SanDisk Ultra II SD Plus. This ground breaking card gives you the capacity to connect your SD card directly into a USB port by transforming into a USB adapter, via our unique hinged cover, eliminating the need for any readers to offload content to a PC.

FEATURES:

- Minimum of 10MB/second sequential read speed for ultra-fast image viewing and data transfer
- Minimum 9MB/second sequential write speed lets you capture large image files faster
- Backed by a lifetime limited warranty
- Low power consumption for longer battery life



WITH USB
CONNECTOR

R9400 512MB

\$72

R9401 1GB

\$125

CRUZER TITANIUM USB FLASH DRIVES

Built with a space-age Liquidmetal® metal casing and virtually indestructible, the Cruiser Titanium sleek design is so rugged it has been tested to be crush-resistant to over 2,000 pounds of force – over two and a half times the strength of titanium alloy. With USB 2.0 connectivity (USB 1.1 compatible, too), it's so fast you'll transfer files in a flash. And you'll know when it's working because the cool blue LED is blinking. When protecting your most critical pictures, videos, music and data really matters, Cruiser Titanium is the drive for you.

FEATURES:

- 9MB/second write and >15MB/s read speeds
- Dimensions: 8.5mm x 20.8mm x 74.8mm (H x W x L)
- Stylish Liquidmetal® body
- Virtually indestructible - crush force resistance to over 2000 lbs
- Laser etched graphics and finish
- Retractable USB connector



N9454 512MB

\$70

S2291 1GB

\$122

WIN COOL PRIZES WITH SANDISK

Purchase any specially marked SanDisk Ultra II card, 512MB or above, between March 1 to April 30, 2006 and receive your chance to win a number of cool prizes, including a Pentax Digital SLR or an O2 Atom PDA phone.

For full details visit
www.sandiskpromo.com.au

Permit Numbers

SA: T06/176

ACT: TP 06/00256

NSW: TPL06/00324

VIC: 06/230

NT: NT06/244

CRUZER PROFILE USB FLASH DRIVE



With built in biometric security, Cruiser Profile delivers the ultimate in portable data security. This highly secure product stores all your data and passwords, accessible only with the swipe of your fingerprint. Just plug in the drive, swipe your finger, and you can log on to any of your stored protected areas in a snap with the exclusive CruiserPass password bank.

T2401 512MB

\$79

T2402 1GB

\$129

PLEASE NOTE:

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STORAGE SOLUTIONS

EXTERNAL DL
LIGHTSCRIBE DVD
BURNER

T3116



T3124

Create your own fabulous custom designs with crisp text, graphics and photos, which you can add to again and again.

- Easily burns professional labels
- Convenient - no need for a printer
- Professional quality laser precision and detail

LaCie DL + LightScribe
16x DVD±RW - USB 2.0

T3116 **\$189**

LaCie d2 DL SuperDrive
LightScribe 16x DVD±RW - USB
2.0 + Firewire
(Includes PC/Mac software)

T3124 **\$229**

LACIE FIREWIRE 800 PCI CARD
(3 PORTS)

J6551 **\$129**

*RENTSMART

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Porsche EXTERNAL USB 2.0 &
FIREWIRE MOBILE DRIVES

NB: The key is not included

- Ultra-lightweight, only 200g
- AC adapter free
- BUS powered via USB 2.0 or Firewire



S2458 40GB

\$225

S1929 80GB

\$319LACIE CARTE ORANGE 8GB
USB 2.0 KEY

Imagine how fun it will be to carry your photo album, MP3 library, and mini-camcorder in a device the size of a credit card for sharing with friends and colleagues whenever you want to. The LaCie Carte Orange is extremely convenient to carry thanks to its rugged design and compact credit card sized shape.

Features:

- Credit card-sized USB key with 8GB capacity
- Compact, rugged metal design
- True plug and play convenience
- Integrated Hi-Speed USB 2.0 cable
- No need for power supply or adapter
- No need for power-sharing cable
- Driver-free for Windows 2000/XP and Mac OS X
- Ultra-thin 6mm (0.23") width

T3091

\$249

d2 ETHERNET DISK MINI & USB DRIVE



- File sharing over a network
- Hi-Speed USB 2.0 interface for private storage
- Share level security via web-based administration tools
- Simultaneous data access by multiple users
- File sharing between Windows, Mac and Linux clients
- Upright, stackable or rack mountable design

S5488 250GB

\$429

d2 EXTERNAL HARD DISK DRIVES



LaCie d2 drives have been designed for professional users in mind. Robust, lightweight, fast cooling and noise free, these drives have unique features such as Kensington cable lock slot, autoswitch power on/off with your computer and are rackmountable in 19" rack.

USB/FIREWIRE/FW800

S9086 250GB d2 Extreme

\$379

USB ONLY

T3460 500GB d2 Bigdisk

\$499

USB/FIREWIRE/FW800

Rent* \$12.54/w

S8584 1TB d2 Biggerdisk Extreme

\$1,119

USB/FIREWIRE/FW800

Rent* \$24.99/w

S9088 2TB d2 Biggerdisk Extreme

\$2,339

These products are for delivery only. Delivery charges apply. See page 63 for details.

BELKIN ACCESSORIES

NOTEBOOK MOBILITY BUNDLE



**NOW
WITH
OPTICAL
MOUSE**

- Notebook bag suitable for notebooks up to 15.4"
- Super soft shoulder strap
- Optical miniscroller mouse
- 4 port USB hub

T0583

\$69

FREEPORT II NOTEBOOK BACKPACK TROLLEY



- Versatility Plus! Use as a trolley bag or a backpack
- Removeable padded notebook sleeve
- Includes 2 removeable cases for MP3 player, PDA or mobile phone

L4276

\$99

7-IN-1 RETRACTABLE CABLE KIT



- Everything you need to connect to USB devices, modems or networks
- Includes all types of USB connections, RJ11 telephone and RJ45 patch and crossover capability
- Retractable cable design for convenient storage in custom carry case

T4136

\$49

WIRELESS CALCULATOR / NUMERIC KEYPAD AND MOUSE BUNDLE



- Calculator and keypad ideal for data entry on the move
- Hi precision mouse for perfect navigation
- Shares a single wireless receiver that snap locks on to keypad for convenient storage
- Full multimedia control from keypad

T4432

\$99

MINI USB GLO MOUSE WITH RETRACTABLE CORD



- Delivers the Plug-and-Play convenience of USB
- Flexible, left or right handed functionality
- Radiates attractive colour changing lights
- Comes with a Belkin Lifetime Warranty

R9475

\$33

2 PORT USB KVM SWITCH WITH AUDIO SUPPORT



- Control 2 computers (notebook or PC) with one keyboard, monitor and mouse. Regain valuable desktop space and use your preferred monitor and keyboard / mouse devices with both computers
- Installs easily
 - 2m cables included - PS/2 available
 - Allows you to also share one set of speakers with both computers

N8931

\$85

HOME SERIES SURGE CUBE WITH TEL + \$55,000 WARRANTY F9H110VauCW



N3356

\$31

HOME SERIES 4-WAY (2M CORD) + TEL + \$75,000 WARRANTY

F9H410au2M



N3361

\$54

GOLD SERIES 7-WAY (3M CORD) + TEL + AV + RJ45 + \$UNLIMITED WARRANTY

F9G726au3M-GRY



N3351

\$148

SOHO SERIES UPS SERIAL & USB 650VA - \$100,000 WARRANTY

F6H650auUNV



M0848

\$249

UNIVERSAL SERIES UPS SERIAL & USB WITH AVR - 800 VA - \$150,000 WARRANTY

F6C800auUNV



H9169

\$333

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PROTECT YOUR STORAGE

MAXTOR ONETOUCH II™ FIREWIRE 800 EDITION FOR CREATIVE PROFESSIONALS - NEW!!



**FIREWIRE
400 / 800
AND USB2**

Tap into the speed of FireWire 800 for fast access to your files, while also having the versatility of FireWire 400 and USB 2.0 interfaces to easily transfer or share data with plug and play convenience. Designed with the creative professional in mind, the high speed, high capacity FireWire 800 Edition comes preformatted for Mac and has the ability to boot the Mac operating system directly from the FireWire 800 drive. The 7200 RPM hard drive with up to 16MB cache comes equipped with award-winning Maxtor OneTouch backup features and Maxtor DriveLock™ for added security.

Mac and PC compatible.

T5885	200GB	\$299
T5886	300GB	\$399
T5890	500GB	\$599

*RENTSMART

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MAXTOR ONETOUCH III

Maxtor OneTouch button - the easy way to make backup copies of your files

Simple backup and storage with Maxtor DriveLock™ to protect the contents of your drive in case of loss or unauthorised use. With up to 500GB, there's ample room to store your videos, photos, graphics, music, and more in one convenient location. Features a simple Maxtor user interface for drive management, security and automatic backup scheduling, as well as system rollback and data synchronization between two or more computers. FireWire 400 and USB 2.0 interfaces for Mac and PC users.

FEATURES:

- Simple Maxtor user-interface for drive management, security and backup scheduling
- Creates historical backup versions with full system and file restore to a point in time
- Data Synchronization between 2 or more computers
- Soft-touch overmold enables stable grip for transport
- Dual interface: FireWire compatible - up to 400Mb/sec data transfer rates, USB 2.0 and 1.1 compatible - up to 480 Mb/sec data transfer rates
- Plug and play storage
- Power on/off button and power management utilities included
- Quick and easy installation
- 7200 RPM, up to 16MB cache buffer



NEW

T5880	100GB	\$239	T5718	300GB	\$389
T5719	200GB	\$289	T5881	500GB	\$589

MAXTOR ONETOUCH™ III, TURBO EDITION

The newest Maxtor OneTouch solution designed for creative professionals. The Turbo Edition RAID solution brings high performance throughput for high quality video editing without dropping frames or automatic mirroring as an additional safeguard. Like always we keep things simple with a wizard interface allowing the user to easily configure the solution for maximum performance. Its new design brings a "soft touch" to the hardware world with a design that includes an innovative exterior finish that not only feels good to touch but provides additional shock and vibration protection for your valuable files inside.

FEATURES:

- User-configurable RAID solution. Use RAID 0 for high performance disk striping or RAID 1 for automatic mirroring
- FireWire 800 for fast data transfer
- Maxtor DriveLock™ protects contents of drive in case of loss or unauthorised use
- Simple Maxtor user-interface for drive management, security and backup scheduling
- Customisable Maxtor OneTouch™ button
- Quick and easy installation
- Pre-formatted for Mac; easily formatted for Windows



**WITH
RAID
SOLUTION**

	Rent* \$8.84/wk			Rent* \$13.43/wk	
T4612	600GB (RAID 0 only)	\$789	T4613	1TB (RAID 0/1)	\$1,199

SHARE YOUR STORAGE

MAXTOR SHARED STORAGE PLUS

NOW WITH SCHEDULED BACK UPS & MEDIA STREAMING

The Maxtor Shared Storage™ Plus solution lets you easily centralise, organise, back up and share family photos, music and data on a home or small office network. Installation is simple - just plug it into your router via Ethernet and the automatic configuration seamlessly integrates into small office and home TCP/IP-based networks.

FEATURES:

- 2 USB ports let you add shared network printers or external storage
- Access files from multiple PCs simultaneously
- You can set access privileges and keep selected folders private
- With Maxtor exclusive Drag and Sort™ technology, you can instantly organise files by dragging them from your desktop PC to the Maxtor Shared Storage Drive
- SimpleView™ provides quick backup and storage status
- Plays back digital photos, music and video to networked home entertainment system¹
- 1 year warranty

¹Media streaming requires UPnP certified Digital Media Adapter (DMA)



R7907 200GB

\$389

Rent* \$7.49/wk

Q1270 300GB

\$485

T4611 500GB

\$669

EXPAND YOUR STORAGE

MAXTOR BASICS 3200 EXTERNAL USB 2.0

INSTANT STORAGE FOR YOUR DIGITAL LIFE

Instantly expand your storage to hold digital photos, music, and data files. It's simple to install--just plug the external drive into an available USB port on your PC. We even include a vertical stand to help keep your desktop clutter-free! Compatible with the fast USB 2.0 interface and USB 1.1. Improve the functionality of your computer by moving your files over to the Maxtor Personal Storage 3200.

THE PERSONAL STORAGE 3200 SOLUTION IS IDEAL WHEN:

- You need simple, reliable add-on storage
- You need to easily handle your expanding collection of digital photos, mp3 audio files and documents
- You need a worry-free storage solution for your personal and work files

FEATURES

- Easy add-on storage for home or office
- Easy installation
- Perfect for digital photos, music, and data files
- Compact design includes stand for vertical orientation
- USB 2.0 and 1.1 compatibility
- Up to 480Mb/sec data transfer rate
- Up to 300GB capacities
- PC compatible



T5755 100GB

\$149

T5757 200GB

\$199

T5758 300GB

\$287

AND THE AWARD GOES TO... MAXTOR!!



CES 2006 INNOVATIONS DESIGN AND ENGINEERING HONOREE

CES - January 2006

Maxtor OneTouch III, with triple interface

A preeminent panel of judges evaluated entries based on four weighted criteria: User value, Aesthetics, Contributions to the quality of life and Innovative design and qualities.



MAXTOR SHARED STORAGE WINS 2006 PC WORLD INNOVATIONS AWARD

PC World - January 2006

Maxtor Shared Storage Plus

The 2006 PC World Innovations Award honors trend-setting products that have emerged with the convergence of PC Technology and consumer electronics.

*RENTSMART

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SMART SWITCHES

PROSAFE 802.11G WIRELESS
VPN FIREWALL 8

FVG318

- Integrated 802.11g wireless access point with speeds up to 108Mbps
- 8 port 10/100 switch
- Advanced security with Stateful Packet Inspection (SPI) firewall, 8 VPN tunnels, WPA2 for WLAN security
- Smart Wizard connects to your ISP quickly and easily
- VPN Wizard effortlessly sets up VPN tunnel configuration

T2399

\$240

PROSAFE VPN FIREWALL 25



FVS124G

- 2 x 10/100 WAN interfaces provide load balancing or failover protection
- 4 x auto-sensing Gigabit LAN switch ports provide high-speed links for servers and PCs
- Up to 25 3DES or AES VPN tunnels using Public Key Infrastructure (PKI)
- Advanced Security and SNMP Management—Advanced Stateful Packet Inspection (SPI) Firewall
- Bundled with ProSafe VPN Client Software single user license

S7022

\$358

*RENTSMART

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Why Netgear Smart Switches?

If you want to add key management features without the complexity of fully managed systems at cost of unmanaged, Smart Switches are an ideal way to add basic management to unmanaged networks. Install Smart Switches anywhere you would use an unmanaged switch and you have a perfect safety net, providing growth, protection and control without the cost or overhead of a full Layer 2 or Layer 3 management implementation. Use a Smart Switch where a fully managed network is already deployed and you are able to extend the management capabilities and improve overall network performance and responsiveness, all while staying within budget.

Introducing the new Stackable Smart Switches from Netgear. The latest products in the Smart Switch Range!



24 PORT STACKABLE SMART SWITCH

FS728TS

- 24 10/100Mbps ports
- Stacking via the built-in gigabit ports
- Smart Switch software with new advanced features
- 4 Gigabit ports

Rent* \$7.05/wk

T4681

**\$629**

48 PORT STACKABLE SMART SWITCH

FS752TS

- 48 10/100 Mbps ports
- 4 10/100/1000 Mbps copper gigabit ports
- 2 Small Form-factor Pluggable (SFP) GBIC slots

Rent* \$12.31/wk

T4683

**\$1,099**

GO GIGABIT

GIGABIT PCI ETHERNET ADAPTER



GA311

- 10/100/1000Mbps performance
- Smart Wizard install assistant for quick setup
- Supports all major operating systems

M2693

\$29

5 PORT GIGABIT SWITCH



GS605

- 5 10/100/1000Mbps ethernet ports
- Smart-honors 802.1p priority tags, great for VoIP applications
- Silent-noise-free operation

P0187 GS605 5 PORT

\$96

P0189 GS608 8 PORT

\$153

GIGABIT PC CARD



GA511

- 10/100/1000Mbps performance
- Smart Wizard install assistant for quick setup
- Supports all major operating systems

Q2474

\$78

16 PORT GIGABIT SMART SWITCH



GS716T

- 16 10/100/1000Mbps gigabit ports
- Easy, browser-based switch management
- 2 small form-factor pluggable (SFP) GBIC slots

S7139

\$528

These products are for delivery only. Delivery charges apply. See page 63 for details.



NETGEAR™

harristechnology



Networking

FINALLY!! WIRELESS AT WIRED SPEED!!!

RANGEMAX 240

RangeMax 240 is an innovation in wireless technology, delivering wireless speeds of up to 240Mbps - as fast as wired Ethernet. RangeMax 240 uses an advanced MIMO (Multi-In, Multi-Out) technology to transmit multiple streams of data in a single wireless channel.

That means, for the first time ever, you can enjoy wired speeds with wireless freedom. You don't need cables to conveniently stream MP3s or high definition quality video, play online games, access networked storage, use Internet telephony, or just surf the web anywhere in your home. Ultimate speed and coverage make dead spots a thing of the past, even in large homes with thick walls and multiple floors. With RangeMax 240, wireless is finally as fast as wired.



**RANGEMAX 240
WIRELESS ROUTER**

13689 WPNT834

\$299



**RANGEMAX 240
WIRELESS NOTEBOOK ADAPTER**

08964 WPNT511

\$199

NETGEAR ADSL MODEMS

A new family of ADSL standards called ADSL2 and ADSL2+ address the growing demand for extra bandwidth to support new applications and services such as video. All Netgear products are ADSL2+ ready, so you can futureproof your network to ensure performance, now and in the future!



ADSL 2/2+ USB/ETHERNET MODEM ROUTER

N6517 DG632

\$85



ADSL 2/2+ MODEM ROUTER

L2610 DG834

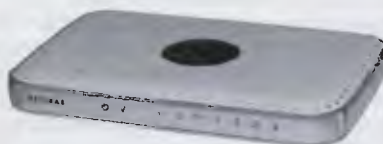
\$108



WIRELESS G ADSL 2/2+ 54Mbps MODEM ROUTER

L2609 DG834G

\$173



RANGEMAX ADSL 2/2+ 108Mbps MODEM ROUTER

T0680 DG834PN

\$289

STORAGE CENTRAL



SC101

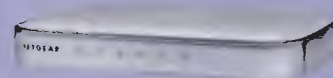
- Share files easily with everyone on the network, while keeping your personal files private
- Safeguard your valuable files by keeping real time duplicate copies - automatically, effortlessly
- Setup and configuration are a breeze
- Advanced backup software included
- Easy upgradeability through IDE drives¹
- Connect via RJ - 45 Ethernet

¹Hard drives must be purchased separately.

34265

\$192

TA612V SMART BROADBAND VOICE ADAPTER WITH ENGIN



TA612VEN

- Turns your Broadband Internet Service into a Telephone
- 2 ports to connect analogue phones and fax machines
- Shares Internet connection via Ethernet ports and Broadband modem
- Prioritises voice traffic for optimum Quality of Service (QoS)
- Free Caller ID, Call Waiting, Voice Mail and 3 way calling
- Local, long distance, and International calls at low prices

S9656

\$139

PLEASE NOTE:

All purchases subject to terms & conditions and returns policy. Delivery charges may apply. Not all items stocked in store but available for pick-up/delivery.

BROADBAND SOLUTIONS FOR HOME & SMALL BUSINESS

NEW SKYPE/VOIP ACCESSORIES

V25 SKYPE/SOFT PHONE HEADSET

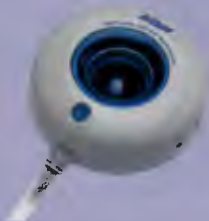


- Stylish and comfortable headset with built-in microphone
- Connects to the speaker and microphone ports on your sound card
- Separate adjustable volume and microphone on/off switch
- Ideal for use with Skype, iChat, MSN and other SIP soft-phone clients

T4123

\$25

V35 SKYPE/SOFT PHONE USB SPEAKER PHONE



- Hands-free USB speakerphone for use with Skype, iChat MSN and other SIP soft-phone clients
- Ideal for business/family conference calling using a VoIP soft-phone on your PC or notebook
- Echo-cancelling Digital Sound Processing (DSP) technology ensures crystal clear echo-free VoIP calls
- Simply connects to the USB port and sound card ports with no driver installation required

T4124

\$129

PLEASE NOTE:

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ADSL2+ WIRELESS MODEM ROUTER



NB5PLUS4W

- Versatile ADSL2+ modem router with USB, 4 ethernet ports and 54Mbps (11g) Wireless Access Point
- Includes a Quality of Service (QoS) function to prioritise particular types of data making it ideal for VoIP use
- Advanced security firewall (SPI) and VPN pass-through
- Access Point features WEP and WPA wireless security

S1160

\$169

SINGLE HOMEPLUG - ETHERNET OVER POWER



NP210SINGLE

- Single Adaptor Extension pack for a NetComm HomePlug ethernet over power network
- Network computers and other IT devices together using your power points
- Share your broadband Internet connection to any room with a power point
- Also available in twin pack

T3162

\$99

MYNETGATEWAY



NB9W

- All your broadband Internet needs in one device
- Features ADSL2+ modem, 4 port QoS router, 2x FXS (VoIP) ports, 1x FXO line port for landline telephone backup and 11g (54Mbps) Wireless Access Point in one box
- Layer 3 Quality of Service (QoS) router ensures high quality VoIP calls
- Web-based configuration for your choice of broadband and VoIP service providers

T3138

\$249

ATA AND DECT PHONE BUNDLE



BPV100V20

- Award winning NetComm VoIP adaptor with cordless DECT phone
- Make cordless VoIP calls in any room of your house
- VoIP Adaptor comes with pre-configured connection to MyNetFone
- Comes with \$5.00 free credit

T4792

\$179

TURBO HOMEPLUG - ETHERNET OVER POWER



NP285

- A powerful and simple networking solution for homes and small businesses
- Create a local area network or share broadband using your power points – at turbo speeds
- Faster HomePlug standard – up to 85Mbps
- A great way to connect gaming consoles to the Internet or complement a wireless network
- Backward compatible with 14Mbps HomePlug
- Also available in single pack

T3595

\$279

5 PORT 10/100/1000Mbps SWITCH



NP3005

- 5 port Gigabit switch ideal for fast home networks or small office use
- Use with a Gigabit Network Interface Card and enjoy transfer rates of 2000Mbps (full duplex)
- Backward compatible with 10/100 ethernet
- Ideal for graphics, multimedia or applications that move large files across the network

L2659

\$99

INTELLIGENT KVM SOLUTIONS

SERVERLINK LCD KVM RACK DRAWERS

The ServerLink KVM Console drawers are designed for applications where space is at a premium or CRT displays are undesirable. With a 15" or 17" TFT LCD screen, keyboard, touchpad and integrated KVM switch housed in an industry standard 19" 1U-height rack drawer, these LCD KVM switches save you up to 1/3 of valuable rack cabinet space.

- Modular design allows for easy expansion
- "A" Grade 15" or 17" LCD panel with zero dead pixels
- Supports PS/2 PC, USB PC, USB Mac and USB SUN platforms
- Locking mechanism locks the drawer when pulled out and pushed in
- Keyboard and mouse can be hot plugged at any time
- Replaceable keyboard and touch pad
- Standard 19" 1U rack drawer
- Cables sold separately - see below



Model	LKS-101H	LKS-801C	LKS-1601C	LKS-1017H	LKS-8017C	LKS-16017C
No. of Computer Ports	1	8	16	1	8	16
LCD Panel Size	15"	15"	15"	17"	17"	17"
KVM Platform Support	N/A	PS/2 & USB	PS/2 & USB	N/A	PS/2 & USB	PS/2 & USB
Maximum Resolution	1024 x 768	1024 x 768	1024 x 768	1280 x 1024	1280 x 1024	1280 x 1024
Rent*	\$24.56/wk	\$26.70/wk	\$31.55/wk	\$27.76/wk	\$30.50/wk	\$34.71/wk
Part Number	H2100	S6917	S6919	P2058	S6920	S6922
Price	\$2,299	\$2,499	\$2,999	\$2,599	\$2,899	\$3,299

ALL these products above are for delivery only. Delivery charges apply. See page 63 for details.

CABLES REQUIRED FOR SERVERLINK LCD - USE PS/2, USB OR COMBINATION OF BOTH

Q1289 2m HD KVM Cable - PS2/VGA 	\$29	T3828 2m HD KVM Cable - USB/VGA 	\$29
Q1290 5m HD KVM Cable - PS2/VGA	\$59	T4274 5m HD KVM Cable - USB/VGA 	\$59

SERVERLINK ELITE KVM

The ServerLink Elite KVM switches allow you to control your servers with a single keyboard monitor and mouse. Using high-density connections, these 8 and 16 port switches use only 1U of rack space making them the ideal choice for any server room where space is at a premium.



N6589 8 PORT KVM 	\$469	P2748 8 PORT KVM Inc 8 x 2m Cables 	\$587
N8989 16 PORT KVM 	\$599	P2749 16 PORT KVM Inc 16 x 2m Cables 	\$749

Rent* \$6.71/wk

Rent* \$6.57/wk

Rent* \$8.39/wk

 These products are for delivery only. Delivery charges apply. See page 63 for details.

SERVERLINK STAR KVM



Control two PCs with a single keyboard, monitor and mouse. All ServerLink Star KVM switches have audio and microphone support for multimedia applications.

2 PORT PS/2 KVM

Q5539 **\$73**

2 PORT USB KVM

Q5540 **\$83**

2 PORT PS/2+USB KVM

Q5541 **\$79**

SERVERLINK KVM EXTENDER FOR PS/2



Use standard Cat5 cabling to extend your monitor, keyboard and mouse up to 150m away in a remote location. Also connect a second computer at the remote location, giving you control of both computers. Supports PS/2 keyboard and mouse.

- Uses Cat5/Cat5E/Cat6 UTP cabling
- Adjustable video compensation for optimum signal
- Supports video resolution up to 1600 x 1200

S6923  **\$499**

*RENTSMART

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WIRELESS / BROADBAND SOLUTIONS

**ALL IN ONE ADSL 2/2+ MODEM/
ROUTER WITH 54Mbps
WIRELESS AND BUILT-IN 4-
PORT SWITCH**
DSL-G604T



P3062 **\$164**

**AIRPLUS 54Mbps WIRELESS
ROUTER**
DI-524



S0650 **\$99**

**AIRPLUS WIRELESS G
54Mbps PORTABLE USB
ADAPTER**
DWL-G122



P3058 **\$59**

**AIRPLUS WIRELESS G
54Mbps PCI ADAPTER**
DWL-G510



S0663 **\$45**

**AIRPLUS WIRELESS G
54Mbps NOTEBOOK ADAPTER**
DWL-G630



S1164 **\$48**

**D-LINK INDOOR 7DBI GAIN
OMNI-DIRECTIONAL ANTENNA**
ANT24-0700



S0749 **\$92**

PLEASE NOTE:

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VOIP WIRELESS BROADBAND ROUTER WITH DORO

The DVG-G1402S is designed for homes or small businesses that want to take advantage of Internet connectivity and Voice over Internet Protocol (VoIP) using a single gateway. The devices allow you to connect two regular phones and with an Internet phone service plan, you can make VoIP calls. They also act as a router to share a Broadband Internet connection and they both include a hardware firewall. Also has 54Mbps wireless capabilities.

DVG-G1402S/DORO

- 802.11b, 802.11g compatible
- 2 analog loop-start FXS interfaces for connection to 2 phones/fax machines
- SIP protocol support
- 10/100Mbps WAN port for Internet broadband connection
- 4 10/100Mbps LAN ports for connection to servers/workstations
- Caller ID function (Soft Switch Dependant)
- Silence suppression to reduce bandwidth consumption
- Priority Queues QoS (Quality of Service) to guarantee voice quality
- Free \$30 credit with GoTalk included
- Free Doro twin pack headset (RRP is \$249.95)



FREE

Doro twin pack headset and \$30 GoTalk credit



T5759

\$349

BROADBAND VPN ROUTER WITH BUILT-IN 4-PORT SWITCH

BROADBAND 54Mbps WIRELESS VPN ROUTER



DI-804HV

- 10/100Mbps port for DSL/cable modem
- 4 built-in 10/100Mbps switch ports
- Up to 40 IPsec VPN tunnels profiles
- Firewall security and parental control
- Serial Port for analog dial-up

L5646

\$189



DI-824VUP+

- 10/100BASE-TX port for DSL/cable modem connection
- Additional COM port for WAN link backup
- WAN port supports PPPoE for DSL dial-up mode to save ISP connection fee
- Built-in 802.11g WAN
- Built-in 4 port switch and parallel/USB print server

N0963

\$275

ADSL 2/2+ USB/FAST ETHERNET MODEM/ROUTER

ADSL 2/2+ MODEM ROUTER WITH BUILT-IN 4-PORT SWITCH



DSL-502T

- Integrated ADSL modem with USB and fast ethernet 10/100Mbps port
- Built-in SPI firewall, DHCP server, advanced routing, filtering, port forwarding and DMZ

R6714

\$85



DSL-504T

- ADSL2/2+ modem/ router with built in 4 port switch
- Integrated ADSL modem with 4 port fast ethernet 10/100Mbps switch
- Built-in SPI Firewall, DHCP server, advanced routing, filtering, port forwarding and DMZ

S1493

\$108

WIRELESS / BROADBAND SOLUTIONS

WIN AN XBOX 360

For your chance to win, purchase a minimum \$200 of any D-Link products on one invoice from Harris Technology between 1 April and 31 May 2006 and tell D-Link in 25 words or less how you will use your D-Link products. The 3 most innovative responses as judged by D-Link will each win an Xbox 360 (premium).

Entries must be received at D-Link by close of business 15 June 2006 and winners will be notified by telephone 30 June 2006.

See dlink.ht.com.au for more details.



WIRELESS 108Mbps GAMING ROUTER



DGL-4300

- Optimised gaming experience with GameFuel Technology
- Up to 108Mbps 802.11g wireless connectivity
- 4 gigabit ethernet ports
- Customizable settings for games and applications

L6109

\$318

BROADBAND GIGABIT GAMING ROUTER



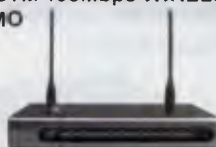
DGL-4100

- Optimized gaming experience with GameFuel Technology
- 4 gigabit ethernet ports
- Customisable settings for games and applications

C9274

\$264

AIRPLUSXTREMEGTM 108Mbps WIRELESS ROUTER WITH MIMO



DI-634M

- Enhanced wireless coverage with smart antenna technology
- Up to 8x better wireless range coverage
- Wireless speeds up to 108Mbps
- Advanced security schemes
- Backward compatible with 802.11b/g devices

C9271

\$261

16 PORT POE WEBSMART SWITCH



DES-1316

- Port-based QoS, maximum 2 queues
- Port trunking of up to 4 10/100 ports in one trunk
- Port mirroring
- Management password-protected access
- Port settings
- Configuration restore/backup

R7521

Rent* \$7.05/wk

\$629

WIRELESS 108Mbps GAMING ROUTER DGL-3420



T3609

\$169

108Mbps WIRELESS PCI ADAPTER WITH MIMO DWL-G520M



C5204

\$147

108Mbps WIRELESS PC/MIMO CARD DWL-G650M



C7252

\$121

5 PORT 10/100/1000 UN-MANAGED SWITCH DGS-1005D



K8301

\$79

8 PORT 10/100/1000 UN-MANAGED SWITCH DGS-1008D



K8853

\$139

WIRELESS LAN POWER OVER ETHERNET KIT DWL-P200



R2785

\$88

*RENTSMART

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PLEASE NOTE:

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DELIVERY ONLY

These products are for delivery only. Delivery charges apply. See page 63 for details.

LINKSYS®

A Division of Cisco Systems, Inc.

A LEADER IN WIRELESS NETWORKING

ALL-IN-ONE USB NETWORK ADAPTER AND WI-FI FINDER



WUSB54G

- High-speed Wireless G networking for your desktop or notebook computer
- Built-in Wi-Fi Finder detects Wireless G and Wireless B signals
- Easy to read display shows network name, channel, signal strength, and security on/off
- Wireless communications are protected by up to 128 bit WEP or WPA encryption

T5537

\$79

IP BUSINESS PHONE



SPA941-AU

- Affordable and full featured 2 or 4 line business class IP telephone
- Connect directly to an Internet telephone service provider, or connect to an IP PBX
- Up to 4 lines. Speakerphone, caller ID, call hold, transfer, conferencing, blocking and more
- Easy installation and secure remote provisioning. Menu based and web based configuration

T4759

\$259

*RENTSMART

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WIRELESS G BROADBAND ROUTER



WRT54G

- All-in-one wireless internet router, allows you to share your broadband connection wirelessly, 802.11G wireless, 4 port 10/100 ethernet switch
- Wireless data rates up to 54Mbps
- Shares a single internet connection and other resources with ethernet wired and Wireless G clients
- Advanced wireless security with 128 bit WEP encryption, MAC or IP address filtering
- 3 year manufacturer limited warranty

H9739

\$124

WIRELESS G ADSL GATEWAY



WAG54G

- ADSL 2/2+ modem with 4 x 10/100 switch ports
- Wireless 802.11g 54MB access point, supports both 11MB and 54MB clients
- Wireless security includes WEP, WPA and 802.1x
- Powerful stateful packet firewall with denial of service attack prevention
- VPN server, 5 VPN tunnels - also supports VPN pass-through
- 3 year manufacturer exchange warranty

M5307

\$186

WIRELESS G BROADBAND ROUTER WITH SRX



WRT54GX

- Internet-sharing router, 4 port switch, with a built-in speed and range enhanced Wireless G (802.11g) Access Point
- Shares a single Internet connection and other resources with ethernet wired, Wireless G, Wireless B, and other SRX devices
- New SRX technology: up to 8 times faster than standard Wireless G (802.11g)
- Increases wireless range by up to 3 times and reduces dead spots in coverage area

R8671

\$285

24 PORT GIGABIT SWITCH WITH WEBVIEW



SRW224G4

- Optimised for growing businesses with 4 expandable Gig ports
- Secure management via SSH/SSL and secure user control via 802.1x and MAC filtering
- IGMP snooping, L2(L3*) COS, queuing and scheduling makes solution ideal for Voice/Video

T4761

\$499

48 PORT GIGABIT SWITCH WITH WEBVIEW



SRW248G4

- 48 - 10/100 Switched RJ-45 ports deliver up to 200Mbps of throughput per port
- Intelligent traffic management with rate limiting, policing, shaping and storm control

Rent* \$10.07/wk

T5539

\$899

24 PORT GIGABIT SWITCH WITH POE



SRW224P

- Delivers reliable power over 10/100 ethernet ports using IEEE 802.3af standard
- Secure management via SSH/SSL and secure user control via 802.1x and MAC filtering

Rent* \$10.07/wk

T5542

\$899

48 PORT GIGABIT SWITCH



SRW2048

- 48 - 10/100/1000 switched RJ-45 ports
- 4 shared mini-GBIC ports
- Port based and 802.1q based VLAN's support up to 256 VLANs

Rent* \$19.04/wk

T5544

\$1699

These products are for delivery only. Delivery charges apply. See page 63 for details.

ENGIN VOICE OVER IP SOLUTIONS



"10c Untimed, Anytime, Anywhere to any Landline phone across Australia"

ENGIN VOICE BOX SERIES 1

ENGIN VOICE BOX SERIES 2



SPECIAL OFFER!

Buy 1 Engin Voice box and get the 2nd one for \$1!!!



The engin Voice Box Series 1 converts your analogue phone signal to digital so that it can be sent over your broadband Internet connection. Simply connect a standard telephone and modem/router. Make and receive phone calls to anyone anywhere. The engin Voice Box series 1 offers the ability to connect 2 telephone lines to engin

The engin Voice Box Series 2 is perfect for an ADSL broadband connection. You can also connect your existing landline so that you can still receive phone calls from your existing telephone number, but still take advantage of engin's great call rates. You will never miss a call with the engin voicebox series 2, in the event of a power or broadband outage your telephone calls will be diverted back to your landline phone service.

S9648

\$139

S9649

\$199

ENGIN ENABLED LINKSYS ROUTER

ENGIN ENABLED WIRELESS LINKSYS ROUTER



SPECIAL OFFER!

Buy 1 Linksys Router and get the 2nd one for \$1!!!



Feature rich engin telephone service, Internet sharing all in one Box!

Connect any telephone to the Linksys Broadband Router and it will convert your analogue phone signal to digital so that it can be sent over your broadband Internet connection. Make and receive phone calls to any phone number worldwide using your Linksys Broadband Router and enjoy massive savings on your phone bills.

- Connect up to 2 engin telephone services and enjoy engin's great rates
- All-in-one Internet-sharing Router PLUS 3 port switch
- Powerful SPI firewall and QoS

Feature rich engin telephone service, Internet sharing and Wireless Access point all in one box!

Make and receive phone calls to any phone number worldwide using your engin enabled Linksys Broadband Router and enjoy massive savings on your phone bills. Connect any telephone to the engin enabled Linksys Broadband Router and it will convert your analogue phone signal to digital so that it can be sent over your broadband Internet connection.

- Connect up to 2 engin telephone services and enjoy engin's great rates
- All-in-one Internet-sharing router, 3 port switch, plus 54Mbps wireless-G (802.11g) access point
- High security: Wi-Fi protected access™ (WPA), and, powerful SPI firewall.

T0725

RT31P2-EA

\$169

T0726

WRT54GP2-EA

\$199

LOCAL CALLS

10c Untimed

NATIONAL CALLS

10c Untimed

MOBILE CALLS

27c per minute

INTERNATIONAL CALLS

from 3.5c per minute

**ENGIN TO ENGIN
CALLS ARE FREE
OF ANY
ENGIN CHARGES**

ENGIN KEY FEATURES

- No Lock In Contracts
- \$9.95 access fee includes geographical telephone number
- 30 day trial period
- No peak or off peak times
- Real time billing
- Free Voicemail
- Receive voicemail messages into your email inbox
- Caller ID
- Call blocking
- Call forwarding
- Call waiting
- Conference calling
- Works with all broadband services (wireless, ADSL and cable)
- Supports dialling 000 (emergency service numbers)

¹ \$1 offer fulfilled directly from engin. for full terms and conditions see engin.ht.com.au

PLEASE NOTE:

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CD/DVD PRODUCTION

EVOCEPT COPYBLAST SERIES



evocept.

- New Standalone Disc Duplication Towers
- DVD/CD and CD versions available
- Choose from 3 or 7 burning drives
- Pro DVD version includes 160GB hard drive for faster burns and storage of commonly used masters
- Up to 16x DVD with dual layer support
- Test, copy and verify functions all supported

DVD 3 DRIVE

Rent* \$11.19/wk

T4713  **\$999**

DVD 3 DRIVE PRO

Rent* \$12.87/wk

T4714  **\$1149**

DVD 7 DRIVE

Rent* \$17.92/wk

T4715  **\$1599**

DVD 7 DRIVE PRO

Rent* \$19.60/wk

T4716  **\$1749**

*RENTSMART

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PRIMERA
TECHNOLOGY, INC.

PRIMERA OPTIVALT ARCHIVAL APPLIANCE

Archive Emails and Critical Data on Robust Optical Media

Like most companies you probably use tape for backups. It's great for everyday use. But tape has a few issues. It can break. It wears out and can become demagnetised. It requires human intervention. All of these issues can put your most valuable data at risk. The new Optivault solves all these problems. It uses reliable, archival grade WORM (Write Once Read Many) optical discs. It's the perfect automated solution when you absolutely, positively can't lose your irreplaceable files and data.

Powered by EMC Dantz Retrospect Software.

Features:

- Quick and efficient searches using the industry's most sophisticated high-speed indexing
- Fast, reliable recoveries
- No more broken or damaged tapes
- Advanced robotics means no more manual loading of tapes or cartridges

Rent* \$55.36/wk

T3963 1 DVD+R DRIVE

 **\$5,999**

RIMAGE DTP360I PUBLISHER



- Totally automated and easy to install and use
- One DVD/CD burning drive and 4800 dpi printer
- 25 disc capacity
- Powerful, intuitive wizard based software
- World class Rimage quality
- Ability to create unique discs using publishing capability

Rent* \$40.82/wk

S1146 1 DVD±R DRIVE

 **\$3,999**

MINI CUBIS DVD DUPLICATOR



The world's smallest automated DVD duplicating desktop unit! Perfect for that small office space.

- 25 disc capacity
- PC connected
- Built in mini disc/business card disc adapter

Rent* \$11.19/wk

Q2051 1 DVD±R DRIVE

 **\$999**

 All Region4 products are available for delivery only. Delivery charges apply. See page 63 for details.

VERBATIM REMOVABLE DATA STORAGE AND SOLUTIONS

DVD-R 25 PACK
16x 4.7GB - SPINDLE



DVD+R 10 PACK
16x 4.7GB - SPINDLE



DVD+RW 30 PACK
4x 4.7GB - SPINDLE



Also available in DVD+R

Also available in DVD-R

T4571 **\$18**

T4676 **\$7**

T4574 **\$35**

DVD+R 100 PACK
16x 4.7GB WHITE INKJET
PRINTABLE - SPINDLE



DVD-R 50 PACK
16x 4.7GB WHITE INKJET
PRINTABLE - SPINDLE



DVD-R 50 PACK
8x 4.7GB WHITE THERMAL WIDE
- SPINDLE



T5712 **\$72**

T4157 **\$42**

Q3397 **\$37**

DVD+R DL 5 PACK
8x 8.5GB DOUBLE LAYER -
JEWEL CASE



DVD-R DL 3 PACK
2-4x 8.5GB DOUBLE LAYER -
JEWEL CASE



DVD-RW 30 PACK
2x 4.7GB - SPINDLE



T3820 **\$37**

T3376 **\$17**

T4943 **\$53**

CD-R 50 PACK
52x 700MB/80MIN SILVER INKJET
PRINTABLE - SPINDLE



CD-R 50 PACK
52x 700MB/80MIN WHITE INKJET
PRINTABLE - SPINDLE



CD-R 50 PACK
52x 700MB/80MIN WHITE WIDE
THERMAL - SPINDLE



Q6490 **\$19**

Q5985 **\$23**

T4158 **\$25**

IN-EAR STEREO HEADPHONES



- Ear-fitting noise reduction sleeve
- High quality stereo sound

T3816 **\$16**

USB WIRELESS HEADSET



- 2.5GHz USB wireless headset
- Digital transmission for high quality

T3818 **\$127**

PROFESSIONAL HI-FI HEADSET



- Professional super bass
50mm drivers
- Cushioned leatherette ear pads

T3815 **\$34**

MINI USB SPEAKERS



- USB Bus-powered (no external
power required)
- 5.1ch Virtual Sound in 2 speakers

T3859 **\$25**

PLEASE NOTE:

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These products are for delivery only. Delivery charges apply. See page 63 for details.

BROTHER PRINTERS

BROTHER FAX-8360P
LASER FAX MACHINE

- Super G3 33.6Kbps high speed fax modem
- Up to 14ppm laser engine for printing of faxes and copies

Rent* \$10.07/wk

G0903

\$899BROTHER FAX 2820
LASER FAX MACHINE

- Mono laser print technology
- Mono faxing capability
- 14.4Kbps fax modem
- Approx 6 seconds per page
- 20 page auto document feeder
- 250 sheet input capacity

S1320

\$349***RENTSMART**

The figures quoted are based on a per week basis over 3 years. Terms and conditions apply. For details see rentsmart.ht.com.au

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BROTHER MFC-9420CN

5 - IN - 1 COLOUR LASER
NETWORK READY
MULTIFUNCTION CENTRE

The Professional Colour Laser Multifunction Centre for the home office or business that requires colour laser printing, copying or Super G3 Faxing.

- Colour laser super G3 33.6Kbps fax/modem speed
- Colour flatbed laser digital copier
- Colour flatbed scanner
- PC fax send/receive
- Print/Copy Speed: up to 31ppm mono, up to 8ppm colour
- Print Speed: less than 15 seconds (mono) / less than 21 seconds (colour)
- Up to 600 x 600 dpi resolution (2,400 dpi class)
- 64MB standard memory (expandable to up to 576MB)
- Up to 250 sheet paper capacity (standard)

Rent* \$16.57/wk

T4070

\$1,479

BROTHER MFC-640CW



8 in 1 wireless colour inkjet multifunction with integrated network.

- Print Speed: up to 20ppm in mono, up to 15ppm in colour
- Print up to 1200 x 6000 dpi resolution
- Colour fax 14.4 kbps with 80 speed dials
- Telephone headset and speaker phone
- Network Interface: 10/100 BASE-TX Ethernet and 54Mbps Wireless

T4745

\$329

BROTHER MFC 8460N



5 in 1 Speed laser multifunction with built in network

- Up to 28ppm
- 1200 dpi resolution
- 32MB standard memory (544MB Max)
- 250 sheets paper capacity
- USB and parallel interface
- Network ready

Rent* \$11.19/wk

T6017

\$999



QUALITY AND INNOVATION, NO RISK



T0775

MONO LASER PRINTER

SAMSUNG ML-2010

- Compact and small footprint at only 5.5kgs
- Cost efficient at only 2.5c per page with toner save on

Key Benefits:

- Easy 4 click installation with no reboot
- Compatible with various operating systems including Windows, Mac and Linux
- Fast print speeds of up to 20 pages per minute ensures your print jobs are done quickly

\$219



T3722

PHOTO PRINTER

PHOTO PRINTER SPP-2040

- 2" LCD screen for PC-less editing
- Inbuilt 7 in 1 card reader

Key Benefits:

- Direct printing via USB or card reader enabled through Pictbridge technology
- Water, fade and finger print resistive prints
- Add the optional Bluetooth dongle to enable printing from your Bluetooth mobile phone

\$219



Q1969

MONO LASER PRINTER

SAMSUNG ML-2250

- Scalable monochrome print solution - add a network card (wired/wireless), second paper tray and/or postscript module
- 5,000 page toner included as a starter

Key Benefits:

- 20ppm printer with a low cost per page of 2 cents with toner save on
- USB and parallel connections
- 2 year return to base warranty

\$339



S2190

COLOUR LASER PRINTER

SAMSUNG CLP-510

- Auto duplexer for double sided printing
- 3 year on-site warranty

Key Benefits:

- Ultra quiet printing, a colour laser that's as quiet as a mono printer
- High paper input capacity with 250 sheet paper tray
- Add a wired and wireless network card to have the printer on your network

\$479

SAMSUNG CONSUMABLES

SAMSUNG TONER FOR SCX-4216F MFC MACHINE

J9653

\$99

OPTIONAL USB BLUETOOTH PICT-BRIDGE DONGLE

T4794

\$59

SAMSUNG ML-2010 3,000 PAGE CARTRIDGE

T0776

\$115

SAMSUNG ML-2250 TONER Q2002

\$145

CLP550N 7000 PAGE BLACK TONER

M9755

\$155

CLP550N 5000 PAGE TONER (CYAN / MAGENTA / YELLOW)

M9756
M9757
M9758

\$175 each

CLP510 5000 PAGE TONER (CYAN / MAGENTA / YELLOW)

S2536
S2537
S2538

\$169 each

SAMSUNG CLP-510 7,000 PAGE BLACK TONER CARTRIDGES

S2534

\$159

*RENTSMART

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HP COLOUR LASERJET PRINTERS

HP COLOR LASERJET
3600 SERIES

- Make your mark in vibrant colour
- Simplify, save time, reduce costs
- Promote your business more effectively than ever
- Meet your workteam's needs with flexible paper handling
- Affordable high volume colour printing for the small workgroup
- Fast 16ppm colour and 16ppm mono printing
- 360MHz processor
- Duty cycle up to 50,000 per month

HP Color Laserjet 3600

Rent* \$11.19/wk

T3243

\$999

HP Color Laserjet 3600N

Rent* \$14.89/wk

T3244

\$1,329

HP Color Laserjet 3600DN

Rent* \$20.68/wk

T3250

\$1,845

¹ Cashback offer valid from 26/01/06 till 17/04/06. Via redemption through HP. See hp.ht.com.au for more details.

*RENTSMART

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HP COLOR LASERJET
2600N PRINTER

\$50
CASHBACK!
via redemption
valid till 17 April

- Fast 8ppm colour laser printing
- High quality, reliable and quiet entry level in line printing
- Vibrant quality colour printing with ImageREt2400
- Standard 10/100 network printing
- Standard 375 page input for versatile printing
- Small true personal desktop design

Rent* \$6.60/wk

S2505 HP Color LJ 2600N

\$589HP COLOR LASERJET
3000 SERIES

- Penalty free mono printing
- Fast 29ppm mono and 14ppm colour printing
- Versatile Colour Access Controls (control by user, Application or shut down colour for individual user completely)
- High quality printing with HP ImageREt 2400
- Optional comprehensive networking management
- Duty Cycle up to 60,000 pages

Rent* \$17.81/wk

T3252 HP Color LJ 3000N

\$1,589

Rent* \$20.06/wk

T3254 HP Color LJ 3000DN

\$1,790

HP COLOR LASERJET 2840 MFP



- Network ready Color LaserJet all-in-one
- Print, scan, copy and digital card-slot
- Fast laser printing 19ppm mono and 4ppm colour
- 1200 dpi resolution scanner
- Super G3 Fax V.34 fax modem (up to 33kbps)

Rent* \$18.93/wk

S1217 HP Color LJ 2840

\$1,689HP COLOR LASERJET
3800 SERIES

- Affordable high volume colour printing for the small workgroup
- Fast 21ppm colour and 21ppm mono printing
- 96MB RAM (160MB for CLJ3800n, 288MB for CLJ3800dn)
- High quality printing with HP ImageREt 3600
- 533MHz processor
- Duty cycle up to 65,000 per month

Rent* \$21.46/wk

T3256 HP Color LJ 3800N

\$1,915

Rent* \$26.70/wk

T3258 HP Color LJ 3800DN

\$2,499

These products are for delivery only. Delivery charges apply. See page 63 for details.



i n v e n t

MONO LASERJET PRINTER SERIES

LASERJET 1020



- **Speed:** Prints up to 14ppm in A4
- **First page out:** 10 seconds
- **Resolution:** 1200 dpi
- **Duty cycle:** 5000 (pages/month)
- **Connectivity:** USB 2.0 high speed

R9102 **\$219**

LASERJET 1022 SERIES



- **Speed:** Prints up to 18ppm in A4
- **Resolution:** 1200 dpi
- **Duty cycle:** 8000 (pages/month)
- **Connectivity:** USB 2.0
- 8MB RAM

R9103 LJ 1022 **\$310**

R9104 LJ 1022N **\$499**

LASERJET 1320 SERIES



- **Speed:** Prints up to 21ppm in A4
- **Resolution:** 1200 dpi
- **First page out:** 8.5 seconds
- 16MB RAM
- 133MHz processor

Rent* \$6.60/wk

P9319 LJ 1320 **\$589**

Rent* \$8.17/wk

P9320 LJ 1320N **\$729**

Rent* \$10.07/wk

P9321 LJ 1320TN **\$899**

LASERJET 3050 ALL-IN-ONE



- **Print:** 18ppm, first page out less than 8 sec, 1200 x 1200 dpi
- 264Mhz, 64MB RAM
- **Copy:** 600 x 600 dpi, 24 bit depth
- **Scan:** 600 x 600 dpi (up to 19,200 dpi enhanced)
- **Fax:** V.34 fax modem - 33.6 kbps

T4389 **\$499**

LASERJET 3055 ALL-IN-ONE



- **Print:** 18ppm, first page out less than 8 sec, 1200 x 1200 dpi
- 264Mhz, 64MB RAM
- **Copy:** Flatbed 600 x 600 dpi, 24 bit depth
- **Scan:** 600 x 600 dpi optical resolution (9600 dpi enhanced) colour scanning
- **Fax:** 33.6kbps

Rent* \$8.95/wk

T4390 **\$799**

LASERJET 3390 ALL-IN-ONE



- **Print:** 21ppm, first page out less than 10 sec, 1200 x 1200 dpi
- 264Mhz, 64MB RAM
- **Copy:** Flatbed 600 x 600 dpi, 24 bit depth
- **Scan:** Flatbed 1200 x 1200 dpi (up to 19,200 dpi enhanced)
- **Fax:** V.34 fax modem - 33.6 kbps

Rent* \$12.09/wk

T4392 **\$1079**

HP LASERJET 2430 SERIES



- Prints up to 33ppm
- 1200 dpi REt and FastRes 1200 dpi
- 64MB RAM, expandable to 320MB
- 400MHz processor

HP LJ 2430TN Rent* \$24.18/wk

Q2892 **\$2158**

HP LJ 2430DTN Rent* \$24.45/wk

Q2893 **\$2289**

HP LASERJET 4250 SERIES



- Up to 43ppm in A4
- Resolution: 1200 dpi
- 500 sheet tray and 100 sheet multi-purpose tray
- Monochrome laser
- Two open industry-standard CompactFlash slots

HP LJ 4250 Rent* \$19.04/wk

Q3919 **\$1699**

HP LJ 4250N Rent* \$24.30/wk

Q2900 **\$2275**

HP LJ 4250TN Rent* \$28.83/wk

Q2894 **\$2699**

HP LJ 4250DTN Rent* \$34.18/wk

Q2890 **\$3249**

*RENTSMART

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HP DESKJET & PHOTOSMART SERIES

HP DESKJET 3940



Easy-to-use, compact printer for basic photo and document printing.

- Up to 4800 optimised dpi
- Up to 1200 x 1200 dpi black
- Up to 16ppm black
- Up to 12ppm colour
- 80 sheet input tray, 50 sheet output tray
- Intuitive, on-screen menus for easy operation

S7444

\$69

PHOTOSMART 8230



Worlds fastest photo printer.

- **Print:** up to 32ppm black and 31ppm colour
- 6 individual ink cartridges
- View, edit and print photos with or without a PC
- 2.5" colour graphic display
- Memory card reader and PictBridge

T1632

\$325***RENTSMART**

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HP'S MEGA CASH BACK ENDS 17TH APRIL!

PHOTOSMART 3310
ALL-IN-ONE

Worlds fastest photo-printing all-in-one with wireless technology.

- **Print and Copy:** up to 32ppm black and 31ppm colour
- **Fax:** 33.6Kbps fax modem
- **Scan:** 4800 x 4800 dpi optical resolution
- Wireless 802.11g
- 6 individual ink cartridges
- View, edit and print photos with or without a PC
- 3.6" colour graphic display
- Memory card reader and PictBridge

T1646

\$510PHOTOSMART 3110
ALL-IN-ONE

Worlds fastest photo-printing all-in-one.

- **Print and Copy:** up to 32ppm black and 31ppm colour
- **Fax:** 33.6Kbps fax modem
- **Scan:** 4800 x 4800 dpi optical resolution
- 6 individual ink cartridges
- View, edit and print photos with or without a PC
- 2.5" colour graphic display
- Memory card reader and PictBridge

T1638

\$419PHOTOSMART 2575
ALL-IN-ONE

View, edit and print photos without a PC with this network-ready all-in-one.

- **Print and Copy:** up to 30ppm black and 24ppm colour
- **Scan:** 2400 x 4800 dpi optical resolution
- Networkable with up to 5 PC's
- Optional 6 ink photo printing
- View, edit and print photos with or without a PC
- 2.5" colour graphic display
- Memory card reader and PictBridge

T3415

\$279HP PSC 1610
ALL-IN-ONE

Enjoy photos that last for generations with multifunction convenience.

- **Print and Copy:** up to 23ppm black and 18ppm colour
- **Scan:** 1200 x 4800 dpi optical resolution
- Optional 6 ink photo printing
- 2 line text LCD
- Memory card reader and PictBridge

R5058

\$169HP PSC 1510
ALL-IN-ONE

Easy to use all-in-one with PictBridge for direct photo printing.

- **Print and Copy:** up to 20ppm black and 18ppm colour
- **Scan:** 1200 x 1200 dpi optical resolution
- Optional 6 ink photo printing
- PictBridge

T2406

\$139HP PSC 1410
ALL-IN-ONE

Compact all-in-one with fold-up paper tray: Basic photo printing.

- **Print and Copy:** up to 18ppm black and 13ppm colour
- **Scan:** 600 x 2400 dpi optical resolution
- Optional 6 ink photo printing

T4297

\$95

* \$100 and \$50 cash back offers valid from 26/01/06 till 17/04/06. Cash back offers via redemption through HP. See www.hp.com.au/retailpromotions for more details.

HP OFFICEJET SERIES

HP'S MEGA CASH BACK ENDS 17TH APRIL!

HP OFFICEJET 7410 ALL-IN-ONE

WIRELESS, POWERFUL AND ULTRA-FAST
THE ALL-IN-ONE FOR SUPERIOR
PERFORMANCE.

- **Print:** up to 30ppm black, 20ppm colour
- **Fax:** 33.6kbps fax modem
- **Scan:** up to 2400 x 4800 optical resolution, 48 bit colour
- **Copy:** 30ppm black, 20ppm colour
- Ethernet
- 50 page ADF
- 8 types of memory card support + PictBridge
- Wireless 802.11g and Ethernet
- Duplex printing
- 2.5" Colour Graphic Display



Rent* \$8.35/wk

\$745

Q2905

HP OFFICEJET 6210 ALL-IN-ONE



- **Print:** up to 23ppm black and 18ppm colour
- **Fax:** 33.6kbps fax modem
- **Scan:** up to 1200 x 2400 dpi hardware resolution
- **Copy:** up to 23ppm black and 18ppm colour
- 2 line text LCD
- Automatic document feeder
- Direct photo printing via PictBridge

R5060

\$325

HP OFFICEJET 7210 ALL-IN-ONE



- **Print:** up to 30ppm black, 20ppm colour
- **Fax:** 33.6kbps fax modem
- **Scan:** up to 2400 x 4800 optical resolution, 48 bit colour
- **Copy:** 30ppm black, 20ppm colour
- Ethernet
- 50 page ADF
- 8 types of memory card support + PictBridge

R5061

\$549

HP OFFICEJET 5610 ALL-IN-ONE



Boost productivity with the compact all-in-one with colour fax.

- **Print:** up to 20ppm black, 13ppm colour
- **Fax:** 33.6kbps fax modem
- **Scan:** 1200 x 2400 dpi optical resolution
- **Copy:** up to 20ppm black, 13ppm colour
- 2 line text LCD display
- Junk fax barrier
- Automatic document feeder

T3163

\$245

HP OFFICEJET 4255 ALL-IN-ONE



Ultra compact all-in-one: print, fax, scan, copy and phone in one small machine.

- Up to 17ppm in black, up to 1200 x 1200 dpi
- Up to 12ppm in colour, up to 4800 x 1200 optimised dpi colour and 1200 input dpi
- Scan quality up to 36 bit colour
- Fax transmission 33.6Kbps

N8513

\$189

*RENTSMART

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HP BUSINESS INKJET PRINTERS

HP DESKJET 460CB



Print high quality black and colour on-the-go!

- Up to 1200 x 1200 rendered dpi black
- **Print:** up to 17ppm black and 16ppm colour
- PictBridge/USB 2.0 full speed port, card slots for CompactFlash Type I, Secure Digital, and MultimediaCard
- 50 sheet input tray
- Battery included (print up to 450 pages)
- Up to 4800 optimised dpi colour
- Optional 6 ink photo printing
- Direct photo printing via CF, SD, MCC card slots and PictBridge enabled cameras

T3509 **\$459**

¹ \$100 cash back offer valid from 26/01/06 till 17/04/06. Via redemption through HP. See www.hp.com.au/retailpromotions for more details.

*RENTSMART

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HP'S MEGA CASH BACK ENDS 17TH APRIL!

HP OFFICEJET PRO K550



HP OFFICEJET PRO K550DTN



Up to 30% lower cost per page than similarly priced laser printers.
Up to two times the speed of entry level colour laser printers.

- Breakthrough speed: print up to 37ppm black, 33ppm colour
- Up to 4800 optimised dpi
- 4 individual ink cartridges
- 250 sheet input tray
- 7500 page duty cycle

- Breakthrough speed: print up to 37ppm black, 33ppm colour
- Up to 4800 optimised dpi
- 4 individual ink cartridges
- 250 sheet input tray
- 7500 page duty cycle
- **Automatic double-sided printing**
- **Additional 350 sheet input tray**
- **Built-in wired Ethernet connectivity**

T3724

\$329

HP BUSINESS INKJET 1000



Colour at high volume and low cost!

- **Print:** up to 23ppm black and 18ppm colour
- 150 sheet input tray
- 8MB RAM
- High-capacity individual ink cartridges
- Duty cycle: 6250 pages per month

S2344

\$249

T4312



\$48

HP DJ9800 A3+ PRINTER

Professional wide format printing for your business



- Up to 30ppm in black and 20ppm colour (A4/letter)
- Up to 1200 x 1200-rendered dpi black
- Up to 4800 optimised colour and 1200 input dpi
- 150 sheet tray
- 32MB memory
- Up to 5,000 page duty cycle

Rent* \$16.25/wk

S2347

\$55

¹ \$100 cash back offer valid from 26/01/06 till 17/04/06. ² \$50 cash back offer valid from 26/01/06 till 17/04/06. Cash back offers via redemption through HP. See www.hp.com.au/retailpromotions for more details.



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i n v e n t

HP SCANNERS

HP SCANJET 2400



Scan photos and documents with this easy to use scanner.

- 1200 dpi optical resolution
- Up to 1200 x 1200 dpi hardware resolution
- 48 bit colour
- Charge coupled device (CCD)
- Preview mode: up to 14 seconds

K7999

\$98

HP SCANJET 8290



Professional document management - 4800 dpi optical resolution.

- 4800 x 4800 dpi hardware resolution
- Scanning speed: up to 15ppm
- Preview mode: up to 4 seconds
- Triple sensor technology
- Automatic document feeder for duplex scanning
- 48 bit colour

Rent* \$25.00/wk

L5118

\$2,340

HP SCANJET 5590



Digital flatbed scanner with automatic document feeder.

- 2400 dpi optical resolution
- 2400 x 2400 dpi hardware resolution
- 48 bit colour
- Transparent material adaptor
- Duplex scanning with 50 page ADF

Rent* \$10.25/wk

\$915

N8512

HP SCANJET 4890



Worlds fastest multiple image scanner

- Up to 4800 dpi optical resolution
- Up to 4800 x 9600 dpi hardware resolution
- 48 bit colour
- Fast and efficient professional scanning
- Scan up to 30 negatives or 16 slides with the built in transparent material adaptor
- Preview mode: up to 6 seconds

T0619

\$445

HP SCANJET



HP SCANJET 4850

Worlds fastest scans of multiple images.

- Up to 4800 dpi optical resolution
- Up to 4800 x 9600 dpi hardware resolution
- Built-in transparent material adaptor - up to 4 slides of 6 negatives
- Charge coupled device (CCD)
- Fastest way to scan multiple images into individual files - about 10 seconds per image
- Preview mode: up to 6 seconds

T3132

\$325



HP SCANJET 8250

Professional document management 4800 dpi optical resolution.

- 4800 x 4800 dpi hardware resolution
- Scanning speed: up to 15ppm
- Preview mode: up to 4 seconds
- Triple sensor technology
- Automatic document feeder for duplex scanning
- 48 bit colour
- Instant on technology
- Transparent material adaptor for scanning slides and negatives

Rent* \$16.57/wk

L5116

\$1,479

*RENTSMART

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EPSON

EXCEED YOUR VISION

EPSON PRINTERS

DOUBLE A A4 PAPER 500 SHEET REAM



T4776

\$6.49

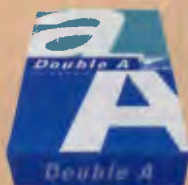
DOUBLE A A4 2,500 BULK CLEVER BOX



T4779

\$31.90

DOUBLE A A3 PAPER 500 SHEET REAM



T4777

\$18.95

*RENTSMART

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INKJET PRINTER

EPSON STYLUS C67

- Print speed: up to 17ppm black (A4 economy) and up to 9ppm colour (A4 economy)
- Resolution: 5760 x 1440 Optimised dpi using RPM technology



T3412

\$85

PHOTO PRINTER EPSON STYLUS PHOTO R230

- Print speed: Up to 15ppm black (A4 memo) and up to 15ppm colour (A4 memo)
- Photo 4" x 6" 57 sec per photo *3
- Resolution: 5760
- Optimised dpi



T3373

\$185

PHOTO PRINTER

EPSON STYLUS PHOTO R1800

- Print speed: Up to 13ppm black (A4 memo) and up to 13ppm colour (A4 memo)
- Photo 8" x 10" 71 sec+ (Photo)
- Resolution: 5760 x 1440 Optimised dpi
- Paper hold capacity: Up to 120 sheets at 90gsm



Rent* \$13.21/wk

S0287

\$1,179

PHOTO PRINTER

EPSON PICTUREMATE 500

- Photo 10 x 15cm Approx. 86 seconds without borders
- Photo 10 x 15cm Approx. 77 seconds with borders



S5294

\$225

PHOTO PRINTER EPSON STYLUS PHOTO R350

- Print speed: Up to 15ppm black (A4 memo) and up to 15ppm colour (A4 memo)
- Photo 4" x 6" 58 sec per photo
- Resolution: 5760
- Optimised dpi



T4508

\$309

8 CARTRIDGE INK SYSTEM PRINTER

EPSON STYLUS PHOTO R800

- New UltraChrome Hi-Gloss™ pigment inks for outstanding photos
- 5760 optimised dpi using multi layer piezo (MLP) print head for smooth and detailed output
- 1.5pi droplet size and variable sized droplet technology (VSDT)
- Eight individual cartridges including matte black ink and gloss optimiser
- True border free printing up to A4



Rent* \$7.27/wk

N9471

\$649

Receive
\$75
Cashback¹



when you purchase an
**Epson STYLUS™ PHOTO
RX530, RX630 or RX650**
between 1 March and 30 April 2006

¹Limit of one claim per eligible printer. Go to www.epson.com.au/promotions to make redemption applications (by 7 May 2006) and to view all terms and conditions.

EPSON

EXCEED YOUR VISION

harristechnology



Printers

EPSON PRINTERS

MULTIFUNCTION PRINTER

EPSON CX5700

- 5760 x 1440 optimised dpi
- Memory card slots and pictbridge
- 4x6 Photo printing in 51 secs
- Print speed:
20ppm 19ppm
- Copy speed:
18ppm/17ppm
- Scanning:
CIS 2300 x 1200dpi



**NOW
WITH
FAX!**

T5925 **\$299**

MULTIFUNCTION PRINTER

EPSON STYLUS RX530

- Print speeds of up to 20ppm in black (A4 text memo mode) and 19ppm in colour (A4 text memo mode)
- Epson MicroPiezo™ Technology for perfect control over every single ink droplet
- True border free printing up to A4
- High resolution 2400 x 2400 film and slide scanning



**\$75
Cashback**
see page 44
for details

T3461 **\$279**

MULTIFUNCTION PRINTER

EPSON STYLUS CX4100

- Up to 20ppm in black (A4 fast mode) and 19ppm in colour (A4 fast mode)
- Resolution: 5760 x 1440 optimised dpi using RPM Tech
- High quality scanning at 1200 x 2400 dpi
- True border free printing up to A4



T4293 **\$149**

COLOUR LASER

EPSON AL C1100N

- Up to 25ppm in black and 5ppm in colour
- Sharp text and dynamic images with an effective resolution of 2400 dpi
- Business photo quality printing featuring Epson's wrap transfer engine
- Flexible paper handling including a standard 250 sheet tray and optional 500 sheet tray



Rent* \$9.35/wk

S3179 **\$835**

CONSUMABLES

EPSON RX430/R250/RX530 INK CARTRIDGE'S

BLACK	R3218	\$14
CYAN	R3219	\$14
MAGENTA	R3220	\$14
YELLOW	R3221	\$14

EPSON C67 INK CARTRIDGE'S

BLACK	T3404	\$13
CYAN	T3408	\$12
MAGENTA	T3409	\$12
YELLOW	T3410	\$12

EPSON PICTUREMATE MEDIA KIT

Includes 100 sheets of PictureMate photo paper and a 6 colour photo cartridge

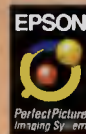
P1648 **\$40**

EPSON STYLUS R600 INK CARTRIDGE'S

MATTE BLACK	N9686	\$18
PHOTO BLACK	N9687	\$17
CYAN	N9690	\$18
MAGENTA	N9692	\$18
YELLOW	N9694	\$18

EPSON PICTURE PERFECT IMAGING SYSTEM

- COMBINING LEADING TECHNOLOGIES FOR INCREDIBLE PRINT QUALITY



EPSON printer

Genuine EPSON ink

Genuine EPSON paper

Best Quality
with the PerfectPicture
imaging system

The PerfectPicture Imaging System, which combines the features of four advanced technologies and delivers outstanding print quality at every level - from colour vibrancy to image detail. Combining 4 key technologies to deliver incredible print quality. These four key technologies are:

- The Epson MicroPiezo print head for absolute ink droplet control and placement
- Quick-Dry inks for rapid ink drying that avoids excessive bleeding
- AcuPhoto Halftoning software for beautiful gradations and detail
- Epson Specialty Media that matches perfectly with Epson's advanced ink technologies

EPSON
EXCEED YOUR VISION

*RENTSMART

The figures quoted are based on a per week basis over 3 years. Terms and conditions apply. For more details see rentsmart.ht.com.au.

PLEASE NOTE:

All purchases subject to terms & conditions and returns policy. Delivery charges may apply. Not all items stocked in store but available for pick-up/delivery.

DELIVERY ONLY

These products are for delivery only. Delivery charges apply. See page 63 for details.

Kodak

harristechnology

Kodak Picture Kiosk

INTRODUCING THE KODAK PICTURE KIOSK AT HARRIS TECHNOLOGY

REAL **Kodak** PICTURES FROM Digital in seconds



Introducing the Kodak Picture Kiosk - available in **North Ryde** and **Fortitude Valley** stores.

It's so easy to use you'll be amazed by the results the very first time. Why? You'll get rich, vibrant colours. Crisp detail. Simply better, brighter pictures - thanks to the exclusive Kodak perfect touch technology. And every picture is protected by Kodak Xtralife™ lamination, which makes them waterproof and even wipeable. So even with life's little spills, smudges and stains, your pictures are sure to stay beautiful. It's all at your fingertips. Just touch the screen for quick and easy hot-to's. Zoom, crop and enhance until the pictures look just the way you want them to.

You can do it yourself and get amazing results.



6" x 4" PRINTS
(PRINT LATER)

ONLY

19^c

EACH



6" x 4" PRINTS
(PRINT NOW)

ONLY

39^c

EACH

- Print directly from your Bluetooth enabled camera, phone, digital camera, memory card or CDROM
- Put your digital images onto CDROM

PLEASE NOTE:

All purchases subject to terms & conditions and returns policy.
Delivery charges may apply.
Not all items stocked in store but available for pick-up/delivery.



i n v e n t



KONICA MINOLTA

harristechnology



Printers & Consumables

HP INKJET CONSUMABLES



HP Supplies

Authorised Reseller



i n v e n t

BONUS HP PHOTO PAPER VALUED AT \$35

When you purchase any 2 original HP Inkjet Print Cartridges specifically marked with a pink tab you will receive a BONUS:

- 1 HP Advanced A4 Photo Paper - 25 sheets - valued at \$17.95
- 1 HP Advanced '4x6' Photo Paper - 60 sheets - valued at \$17.95

Terms and conditions apply. For more details and to register visit www.hp.com.au/supplies

HP ORIGINAL REWARDS

HP Original Rewards is an exciting program from HP that rewards SMB for purchasing (and recycling) HP LaserJet Print Cartridges, Inkjet Cartridges and HP Paper. Register now to receive points for every purchase invoice you send in. Terms and conditions apply. For more details see www.hp.com.au/originalrewards

HP PLANET PARTNERS

HP Planet Partners and Cartridges 4 Planet Ark have created a program that extends not only the life of your print cartridges, but also the life of the planet. More Information at: www.hp.com.au/recycle

*RENTSMART

The figures quoted are based on a per week basis over 3 years. Terms and conditions apply. For more details see rentsmart.ht.com.au.

KONICA MINOLTA PRINTERS

KONICA MINOLTA magicolor® 2400W



- 5ppm colour
- 20ppm monochrome
- 2400 x 600 dpi
- Hi-speed USB 2.0 interfaces
- Windows Print System
- 2 year on site warranty

Rent* \$6.66/wk

\$595

Q8208

KONICA MINOLTA magicolor® 2430DL



- Personal colour laser printer
- Up to 20ppm mono, 5 ppm colour
- 10/100BaseTX Ethernet® & USB 2.0 (high speed) interfaces
- 2400 x 600 dpi resolution
- 200 sheets input standard / 700-sheets input maximum
- Direct Photo print
- Windows® & Macintosh compatible

Rent* \$8.01/wk

\$715

R4297

KONICA MINOLTA magicolor® 5430DL



- Up to 20ppm A4 colour/monochrome
- 10/100BaseTX Ethernet
- 2400 x 600 dpi resolution
- 64 MB RAM memory
- Duty cycle: up to 60,000 pages per month
- Windows® & Macintosh compatible

Rent* \$17.92/wk

\$1,599

P8495

KONICA MINOLTA pagepro 1400W



- Print Speed: 16ppm (A4)
- 1200 x 600 dpi resolution
- 8MB SDRAM
- 150 sheet multi purpose tray
- Duplex printing - manual
- Duty cycle: up to 9000 pages per month

T4546

DELIVERY ONLY

\$159

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These products are for delivery only. Delivery charges apply. See page 63 for details.

CANON PRINTERS

DIGITAL CAMERAS

CANON IXUS
WIRELESS CAMERA

- 5.0 Megapixel
- 3x optical zoom lens
- 2.0" LCD screen
- Super fast DiGIC II Processor
- Wireless direct printing and image transfer

rent* \$8.95/wk

T5597

\$799

CONSUMABLES

CANON CLI8BK PHOTO BLACK
INK CARTRIDGE

S9587

\$26CANON CLI8Y YELLOW
INK CARTRIDGE

S9565

\$26CANON CLI8M MAGENTA
INK CARTRIDGE

S9564

\$26CANON CLI8C CYAN
INK CARTRIDGE

S9563

\$26

*RENTSMART

The figures quoted are based on a per week basis over 3 years. Terms and conditions apply. For more details see rentsmart.ht.com.au

PLEASE NOTE:

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CANON MP800
CD/DVD Printing

- Printer/copier/scanner
- 1 pl FINE print-head technology
- 9600x2400 dpi
- 5 individual ink tanks
- 6x4 photo : 36 sec
- Photo reprint - film/photo
- Copy: DVD/CD direct copy. Auto exposure copy.
- Scan: 2400 x 4800 dpi
- Film/slide scanning, Photo correction
- Camera, Card, Mobile and Film direct
- 3.5" LCD screen
- CD/DVD printing
- Auto duplex/2 way paper feed

T0559

\$439CANON IMAGECLASS MP780 MFP
Colour printer/scanner/copier/fax

- ContrastPLUS 5 individual ink tank for vivid and heightened contrast
- Fast borderless printing and copying 4x6, 5x7 and A4
- **Prints directly onto printable surface CD/DVD**
- Built-in automatic duplex printing
- Automatic document feeder
- Scan at 2400 dpi optical resolution
- USB 2.0 Hi Speed
- PictBridge and Bubble Jet Direct compatible - digital camera printing
- Includes great range of software: Easy-PhotoPrint, Easy-WebPrint, PhotoRecord and CD-LabelPrint

Q5710

\$539

CANON PIXMA MP450



(Camera not included)

- Print, copy and scan
- 2pl fine print-head technology
- 4800 x 1200 dpi
- 6x4 photo: 55 secs
- Copy: 22/17cpm, auto exposure copy
- Scan: 1200 x 2400 dpi, photo correction
- Camera, card and mobile direct
- 1.9" LCD screen

S9383

\$215

CANON PIXMA IP5200



(Camera not included)

- Borderless 4"x 6" photo in approx. 36 seconds
- Maximum 9600 x 2400 color dpi with microscopic droplets as small as 1 picoliter
- FINE print head technology for impressive speed and photo quality
- ChromaLife100 system for long lasting, beautiful photos
- Built-in 2 sided printing and second paper tray for convenient paper selection
- PictBridge ready - just connect and print!

T0451

\$229

COREL SOFTWARE



Editors Choice, Technology & Business Magazine, February 2006

CORELDRAW GRAPHICS SUITE X3

CorelDRAW Graphics Suite X3 is trusted by busy designers and business users to transform ideas into professional results - fast! With this comprehensive graphics suite, users can confidently tackle a wide variety of projects - from logo creation and web graphics, to multi-page marketing brochures, or eye-catching signs.

Now with enhanced illustration, page layout, photo editing, powerful bitmap-to-vector tracing, and helpful new learning tools, this integrated graphics suite delivers the ultimate combination of superior design capabilities, speed, ease-of-use and affordability that cannot be matched by any other graphics software.

T4499 FULL

\$609

T4590 UPGRADE

\$299

T4591 STUDENT & TEACHER*

\$157

* For qualified educational users and not for commercial use.

COREL WORDPERFECT OFFICE X3 HOME EDITION



T4592

\$165

COREL PAINTSHOP PRO X



T0535 FULL

\$249

T0536 UPGRADE

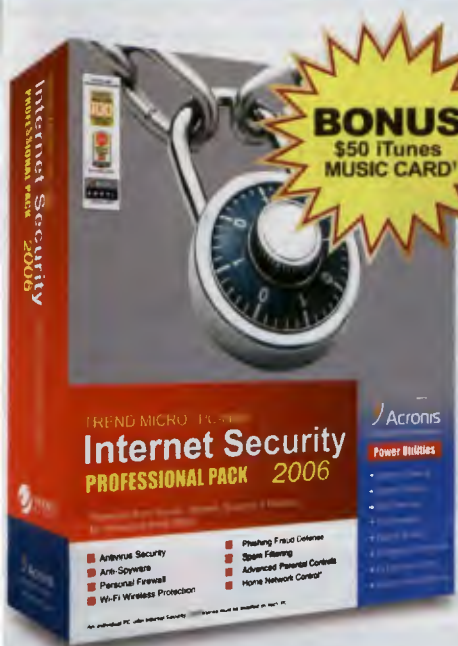
\$149

T0537 ACADEMIC*



\$185

INTERNET SECURITY



TREND MICRO PC-CILLIN INTERNET SECURITY PROFESSIONAL PACK 2006

Trend Micro PC-cillin Internet Security Professional Pack 2006 combines award-winning antivirus security including a personal firewall and Acronis Power Utilities.

Trend Micro PC-cillin Internet Security stops and removes spyware, protects against phishing fraud, and blocks spam. Plus, it guards your wireless network by alerting you when an intruder uses your Wi-Fi connection.

Acronis Power Utilities includes:

- Acronis Privacy Expert 8.0
- Acronis Migrate Easy 7.0
- Acronis Disk Editor 6.0
- Acronis Recovery Expert

* Bonus \$50 iTunes music card via redemption from Manaccomm. Offer available from 10/03/06 until 31/05/06 with the purchase of Trend Micro PC-cillin Internet Security Professional Pack 2006 only. See box for details or visit manaccomm.ht.com.au Standard postage fees apply.

T6029

\$139

ZONEALARM INTERNET SECURITY SUITE 6



Get easy-to-use, comprehensive protection against hackers, spyware, worms, identity thieves, spam and much more. With 12 months of updates and support it is perfect for the home user.

- Anti-Spyware and email security
- ID/Privacy protection and parental control
- Antivirus protection

S9405

\$94

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WEB AND DESIGN BUNDLES FROM ADOBE

ACADEMIC WEB DESIGN BUNDLE



- Adobe Web Bundle offers Studio 8, the essential solution for web design and development, with the unified design environment of Adobe CS2 Premium
- Design, develop, manage and maintain rich, interactive experiences for easy delivery to viewers on the web, on mobile devices and in print using Flash format and Adobe PDF
- Adobe Creative Suite Premium combines full versions of Adobe Photoshop CS2, Adobe Illustrator CS2, Adobe InDesign CS2, Adobe GoLive CS2, Adobe Acrobat 7.0 Pro, Version Cue CS2, Adobe Bridge and Adobe Stock Photos
- Studio 8 combines full versions of DreamWeaver 8, Flash Pro, Fireworks 8, Contribute 3 and FlashPaper 2

For academic eligibility please visit: <http://www.adobe.com/education/purchasing/qualify.html>

T4337 WIN  **\$859**

T4336 MAC  **\$859**

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ADOBE DESIGN BUNDLE

The Adobe® Design Bundle offers the unified design environment of Adobe Creative Suite 2 Premium software with Flash® Professional 8 software, the industry's choice for creating advanced interactive content. Now with one package, you can design, develop, manage, and deliver a consistent experience — using industry standards such as Adobe PDF and Flash format — to millions of people around the world in print, on the web, and on mobile devices.

Includes:

- Adobe Photoshop® CS2
- Adobe Illustrator® CS2
- Adobe InDesign® CS2
- Adobe GoLive® CS2
- Adobe Acrobat® 7.0 Professional
- Version Cue® CS2
- Adobe Bridge
- Adobe Stock Photos
- Flash Professional 8

To upgrade successfully, you will need an earlier licensed version of Adobe Creative Suite Standard or Premium on the same platform as this purchase.



T4080 WIN  **\$2,399**

T4081 MAC  **\$2,399**

T4084 UPGRADE - WIN  **\$1,549**

T4085 UPGRADE - MAC  **\$1,549**

ADOBE WEB DESIGN BUNDLE

The Adobe® Web Bundle offers Studio 8, the essential solution for web design and development, with the unified design environment of Adobe Creative Suite 2 Premium software. Now with one package, you can design, develop, manage, and maintain rich, interactive experiences for easy delivery to millions of viewers on the web, on mobile devices, and in print using industry standards such as Flash® format and Adobe PDF.

Includes:

- Adobe Photoshop® CS2
- Adobe Illustrator® CS2
- Adobe InDesign® CS2
- Adobe GoLive® CS2
- Adobe Acrobat® 7.0 Professional
- Version Cue® CS2
- Adobe Bridge
- Adobe Stock Photos

Studio 8

Combines full versions of:

- Dreamweaver® 8
- Flash Professional 8
- Fireworks® 8
- Contribute™ 3
- FlashPaper™ 2

To upgrade successfully, you will need Adobe Creative Suite 1.x Standard or Premium and Macromedia Studio MX or Studio MX 2004 on the same platform as this purchase.



T4082 WIN  **\$2,859**

T4083 MAC  **\$2,859**

T4086 UPGRADE - WIN  **\$1,459**

T4087 UPGRADE - MAC  **\$1,459**

 These products are for delivery only. Delivery charges apply. See page 63 for details.

ADOBE SOFTWARE

ONE SUITE SOLUTION • INTRODUCING STUDIO 8



ADOBE STUDIO 8

Design, develop, and maintain effective online experiences. Studio 8 now includes:

- Dreamweaver® 8 - develop websites and applications
- Flash® Professional 8 - author rich interactive content
- Fireworks® 8 - create and optimise web images
- Contribute™ 3 - maintain web content
- FlashPaper™ 2 - convert files to PDF and FlashPaper
- A must-have for designing, developing, and maintaining websites and applications
- Integrate video, audio, text, graphics and animation for media-rich experiences
- Ensure consistency and standards support across browsers and platforms
- Great workflow with Adobe®, Microsoft®, and popular nonlinear editing software
- Create, test, and deliver content for millions of mobile phones and devices
- Supports Windows and Mac OS X

T4263 FULL

\$1525

T4265 UPGRADE

\$655

ADOBE DREAMWEAVER® 8



- All-in-one design and code editor to support the way you work
- Build standards-based sites using rich visual tools for XHTML and CSS
- Integrate XML-based data with a powerful, visual, drag-and-drop workflow
- Add Flash Video in less than five mouse clicks
- Supports Windows and Mac OS X

T4290

\$615

T4291 UPGRADE

\$335

ADOBE FLASH® PROFESSIONAL 8



- Experience the biggest Flash release ever!
- New filter effects, blend modes, and advanced animation controls
- Easily create and deliver great interactive video
- Deliver consistent, quality end-user experiences
- Create, test, and deliver content for millions of mobile devices
- Supports Windows and Mac OS X

T4299

\$1079

T4302 UPGRADE

\$489

ADOBE ACROBAT 7.0 STANDARD



Adobe Acrobat 7.0 Standard software is the simple way to create and share more secure and reliable Adobe PDF documents. Generate Adobe PDF files that accurately represent the original document, and take advantage of robust tools for sharing information and commenting on electronic files.

Q7824 WIN

\$475

Q7825 MAC

\$475

ADOBE ACROBAT 7.0 PROFESSIONAL



Adobe Acrobat 7.0 Professional software is the advanced way to create, control, and deliver more secure, high-quality Adobe PDF documents. Assemble electronic or paper files—even Web sites, engineering drawings, and e-mail—into reliable PDF documents that are easy to share with others using free Adobe Reader® 7.0 software.

Q7822 WIN

\$689

Q7823 MAC

\$689

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Products for Small and Medium Business

QUARK BONUS UPGRADE OFFER

SHADOWCASTER PROMO

Purchase a copy of QuarkXPress 6.5 between 23/02/06 and 30/04/06 to receive a bonus copy of ShadowCaster. Complete the coupon which can be found on: http://www.quark.com/sales/desktop/promotions/shadowcaster/shadowcaster_claimform.pdf to redeem the offer. Claim form must be received within 30 days of purchase date. Standard postage charges additional.

WHAT IS SHADOWCASTER?

ShadowCaster for QuarkXPress is the key to that something special. No other XTension can add this much impact to your design. Its intuitive interface and interactive preview make it fun to create great designs in QuarkXPress. So when your next job calls for the best-looking, high-quality pages you can create, make sure ShadowCaster 3.2 is in your arsenal. It adds six types of effects to QuarkXPress including Drop Shadows, Inner Shadows, Outer Glows, Inner Glows, Bevels, and Embosses.



QUARK XPRESS 6.5

QuarkXPress™ is powerful layout software with an intuitive, versatile interface that lets you combine writing, editing, and typography with colour and pictures to produce dynamic final output.

The intuitive QuarkXPress interface is largely based on palettes that let you choose from a variety of tools, styles, colours, measurements, and so on to quickly construct a document. Using the comprehensive editing features of QuarkXPress, you can import and manipulate pictures and text. With the powerful printing features of QuarkXPress, you can output your documents to precise specifications.

¹ Purchase QuarkXPress 6.5 between 01/03/06 and 30/04/06 and receive a BONUS Upgrade to QuarkXPress 7 via redemption from Scholastic Australia. (See box for redemption form and full terms and conditions. Version 7 due for release in May 2006)

T5859 WIN

\$1759

T5861 WIN UPGRADE

DELIVERY ONLY

\$58

T5860 MAC

DELIVERY ONLY

\$1759

T5862 MAC UPGRADE

DELIVERY ONLY

\$58

NEW EMC INSIGNIA RETROSPECT BACKUP 7.5

- New user initiated restore add-on
- New single-write multiple read backups to disk
- New automated windows client deployment
- Improved exchange and SQL support

ADD-ON PRODUCTS:

- Exchange Server Agent
- SQL Server Agent
- User initiated restores
- Open file backup
- Disaster recovery
- ADD-ON VALUE PACK (includes all add-ons)

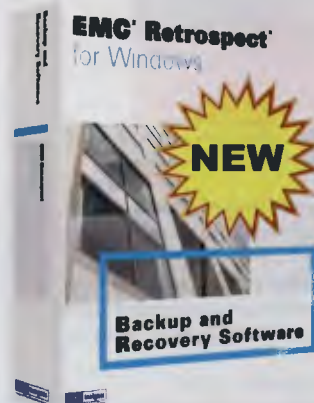
***CALL 1300 13 9999
FOR LATEST PRICING**

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Products for Small and Medium Business



New EMC Insignia® Retrospect® 7.5 for Windows provides complete protection for file servers, desktops, notebooks, and business-critical applications.

RETROSPECT PROFESSIONAL - Designed for home and small office users who want to protect a single Windows computer and up to two additional networked Windows, Macintosh or Linux desktops and laptops.

RETROSPECT DISK-TO-DISK - Backup and restore a single Windows server to disk, CD or DVD.

RETROSPECT SINGLE SERVER - Designed for small or mid size businesses with a single Windows server. Runs on Windows server and includes unlimited client licenses to protect networked desktops and laptops running Windows, Mac, Linux, Novell Netware and Solaris.

RETROSPECT SMALL BUSINESS SERVER* - Backup and restore a single Windows Small Business Server, as well as networked desktops and laptops running Windows, Mac, Linux, Novell Netware and Solaris. Standard Edition includes an Exchange Server Agent and Disaster Recovery for the server while the Premium Edition includes all the above plus an SQL Server Agent.

RETROSPECT MULTI SERVER* - Ideal for a network with multiple Windows servers. Also includes unlimited client licenses to protect networked servers, desktops and laptops running Windows, Mac, Linux, Netware and Solaris.

RETROSPECT PROFESSIONAL 7.5

T5156

\$169

RETROSPECT SINGLE SERVER 7.5

T5157

DELIVERY ONLY

\$1099

DELIVERY ONLY

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EFFORTLESSLY MANAGES ALL YOUR INFORMATION



FILEMAKER PRO 8 ADVANCED

FileMaker Pro 8 Advanced replaces FileMaker Developer and has all the features of FileMaker Pro 8 plus advanced development and customisation tools so you can efficiently build more powerful, more customised databases!

With the ability to customise menus and add Tooltips, as well as robust troubleshooting and database analysis tools, FileMaker Pro 8 Advanced provides powerful tools to:

- Add custom menus
- Add custom tooltips
- Import multiple tables at once
- Test scripts without modifying your database
- Create standalone runtime applications
- Create kiosk-based applications
- Build more robust calculations with custom functions
- Generate a report that provides an overview of your database schema

S8604

DELIVERY ONLY

\$845

SPECIAL OFFER!

For a limited time only, FileMaker Pro 6 through 8 customers are eligible to upgrade to FileMaker Pro 8 Advanced until June 30, 2006. For further information visit filemaker.ht.com.au



FILEMAKER PRO 8 WORK FASTER. SHARE MORE.

FileMaker Pro 8 is the best FileMaker ever! Work significantly faster and share information with more people and programs than ever before with this exciting new FileMaker upgrade. It includes breakthroughs in sharing with Adobe Acrobat and Microsoft Office, as well as new features designed to help you work faster every day.

New features include the ability to:

- Create Adobe PDF files
- Create Microsoft Excel files
- Email the contents of any field instantly
- Search databases easier
- Import tables easily
- Perform email merges
- Create cleaner looking database layouts
- Document databases better
- Build layouts with multiple tabs
- And many more time-saving features, including automatic field completion, integrated spell checker, and new development features!

S8597

\$459

FILEMAKER SERVER 8

FileMaker Server 8 is high performance server software for teams of FileMaker users who want to maximise the performance and security of their shared databases while automating backups and other administrative tasks.

FileMaker Server 8 includes robust, real-time database sharing, advanced security options and powerful remote administration capabilities.

T0640

DELIVERY ONLY

\$1689



FILEMAKER MOBILE 8

FileMaker Mobile 8 is a companion to FileMaker Pro 8, designed specifically for Palm OS and Pocket PC handhelds, so you can easily extend your desktop to mobile individuals and workgroups.

T3838

DELIVERY ONLY

\$109



FILEMAKER SERVER 8 ADVANCED

FileMaker Server 8 Advanced is high performance server software that takes full advantage of the new FileMaker Pro 8 features while increasing reliability and maximising database performance.

With more than 50 core improvements to the FileMaker Server 8 engine, you'll experience increased reliability and stability of your FileMaker solutions. In addition, the engine has been optimised to perform key tasks faster.

T4381

DELIVERY ONLY

\$4231



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QUICKEN SOFTWARE



Quicken Advantage has been designed so that your focus remains on your business, and not your business software. We enable this by giving you the tools to keep you on top of your software needs.

The key benefits of membership include:

- **Unlimited weekday technical support**
- **All Upgrades** sent to you upon release at no additional cost
- **Dedicated Advantage contact numbers** to help you stay in touch with Quicken or access our specialised Advantage Technical Support team
- **A personal email** as soon as any software updates are available so you can download them directly from the web
- Your own **personalised website** via www.quicken.com.au with the latest information and updates, to make running your business Quicken.Easy
- Quarterly **Advantage Newsletter** by e-mail
- Special **training offers**

^ Please note that terms and conditions apply to the Quicken Advantage Membership Program.

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QUICKBOOKS PREMIER 2005/06



The multi-user solution - QuickBooks Premier 2005/06 is for 2 to 5 users, and has industry-specific editions tailored to your needs.

- Share data between up to 5 simultaneous users
- Industry-specific editions for ease of use
- Microsoft Office integration to increase efficiency
- Comprehensive payroll and employee management
- **Includes 12 months technical support and upgrades with Quicken Advantage^**

R9294

\$1,525

QUICKBOOKS PLUS 2005/06



QuickBooks Plus 2005/06 is perfect for small business with employees - it includes integrated payroll and inventory management.

- Track GST, prepare BAS and lodge it online
- Comprehensive payroll and employee management
- Access over 100 types of reports and graphs
- **Includes 12 months technical support and upgrades with Quicken Advantage^**

R9291

\$449

QUICKBOOKS PRO 2005/06



QuickBooks Pro 2005/06 has all the tools for a professional business. Includes integration with Microsoft Office and designated templates, as well as estimates and job costing - to see which projects are making money.

- Includes Time Tracking, Estimates, Quotes and Job Costing
- Comprehensive payroll and employee management
- **Includes 12 months technical support and upgrades with Quicken Advantage^**

R9292

\$625

QUICKEN PERSONAL PLUS 2006



Quicken Personal Plus 2006 provides tools to help you manage your finances, prepare for tax time and plan for the future.

- Budgeting tools - help you manage your finances
- Monitor all of your personal and business investments
- Prepare for tax time
- Download your portfolio and trading history

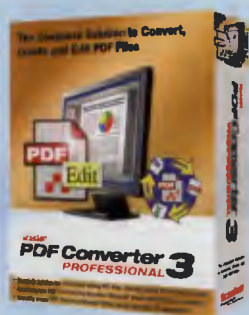
T0937

\$145

^The offer applies only to existing Quicken Australia customers with a previous registered version of Quicken Personal or Quicken Personal Plus who purchase full version of Quicken Personal Plus 2006 between 1 November 2005 and 31 October 2006. For full terms and conditions go online to quicken.ht.com.au. Offer is by redemption from Quicken, standard 50c postage fees apply.

NUANCE PRODUCTIVITY APPLICATIONS

SCANSOFT PDF CONVERTER PROFESSIONAL 3



Better PDF for Business!

ScanSoft PDF Converter Professional gives you everything you need to create, convert and edit PDF files - within a single, easy-to-use application. Call **1300 13 9999** for volume licensing prices.

S1878

\$169



OMNIPAGE PROFESSIONAL 15

OmniPage Professional 15 is the most accurate document conversion available, turning paper and PDF files into electronic files you can edit, search and share. New OCR engines and precise analysis of page layout ensure that your electronic documents look exactly like the original - complete with text, graphics, columns and tables.

Use OmniPage for the following:

- Repurpose documents automatically rather than retyping them
- Document conversion - transform your existing documents into your favourite formats
- Transform piles of paper to searchable PDF archives
- Ensure fast perfect scans every time with SET (Scanner Enhancement Technology™) tools
- Share documents broadly and quickly via email, web, document management system or FTP

OmniPage is the one product you need to convert, edit, archive and share all your paper and PDF documents.

S8698 FULL

\$845

S8700 UPGRADE

\$335

ACT! 8 - MANAGE YOUR CUSTOMER RELATIONSHIPS

QUICK STUDY GUIDE

IDEAL FOR ALL ACT! USERS

- ACT! QuickStudy Guide steps users through using all new features in ACT!
- Learn everything about ACT! entering, saving and sorting contacts to completely customising fields and screens to match business processes
- Explore powerful productivity features
- Get more than 100 complete, self-paced interactive exercises featuring real-world lessons to teach beginning, intermediate and advanced techniques

T5904

\$64

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ACT! 8

ACT! by Sage is the #1 best-selling contact and customer manager that helps you make contact, build relationships, and get results. ACT! enables you to instantly access key contact and customer information, manage and prioritise activities, and track all contact related communications so you can grow productive business relationships.

- Organise your contacts
- Stay in touch
- Prioritise your work
- Track sales opportunities
- Report on activities
- Information on the go

ACT! allows you to:

- Centralise critical contact and customer information and stay organised
- Manage and grow business relationships through top-notch communications
- Prioritise your work to stay on top of appointments and tasks
- Forecast and track sales opportunities for an improved bottom line

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T3089 UPGRADE

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WHAT TODAY'S CAD DESIGNERS WANT

STUDENT EDITION#
DESIGNED FOR
PROFESSIONALS,
PRICED FOR
STUDENTS

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- Autodesk Mechanical Desktop
- AutoCAD Mechanical
- AutoCAD (included as part of AutoCAD Mechanical)

R7574

**\$265***

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S5370

**\$265***

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R7575

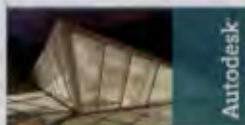
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Autocad, Autodesk Civil 3D and Autodesk VIZ student versions also available separately.

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T6087

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AUTOCAD LT® 2007

Enhance your productivity with AutoCAD LT software, the world's number one-selling drafting and detailing product. AutoCAD LT 2007 is better than ever. Blocks are now dynamic, Express Tools for better layer management were added, and drafting enhancements abound. Now the tasks you perform every day are streamlined with just one thing in mind—boosting productivity. With full DWG file format compatibility, and access to latest drawings, you've never experienced a more efficient design process.

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P7266

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A1319

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A1320

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MICROSOFT WINDOWS XP WITH SERVICE PACK 2

WINDOWS XP SERVICE PACK 2 WITH ADVANCED SECURITY TECHNOLOGIES

Service Packs offer convenient, all-in-one access to the most up-to-date drivers, tools, security enhancements, and other critical updates. The latest service pack for Windows XP - Service Pack 2 (SP2) - is all about security improvements, and it's one of the most important service packs ever released.

XP SERVICE PACK 2 BENEFITS INCLUDE:

- **Take more control with Windows Security Centre** - here you can check your Windows Firewall, AV Software and Windows Security updates easily in location.
- **Help protect your PC with the NEW Windows Firewall** - a Firewall helps you to guard against unwanted attacks on your PC when you are connected to the internet.
- **Block distracting pop-ups in Microsoft Internet Explorer** - now you have the option to reduce unwanted advertising and content and stop wasted bandwidth by blocking unwanted advertising pop-ups.
- **Attachment Manager** - helps protect against viruses that can spread through E-Mail, Windows Messenger and Internet Explorer by identifying potentially unsafe attachments.
- **Bluetooth Hardware Support** - Bluetooth is the latest in Wireless technology that enables you to link your PC with the latest Bluetooth-enabled wireless devices, including keyboards, mice, printers and mobile phones.

WINDOWS XP HOME - WITH SERVICE PACK 2 INCLUDED



- **The most dependable Windows operating system yet**
Windows XP sets the standard in efficient computing with a new visual design, the reliable Windows engine, and Internet security features.
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Transferring footage to your computer is faster and editing is easier than ever, with everything you need to create, edit, and share your home movies.
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Windows XP has built-in Internet, home networking, and real-time voice, video, and instant messaging support. Publish pictures to a Web site or shop online.
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Invite a friend or support professional to connect to your PC over the Internet to fix a problem or answer a question.

WINDOWS XP PROFESSIONAL - WITH SERVICE PACK 2 INCLUDED



- **Added features**
The Professional Edition adds security and privacy, advanced recovery options, improved network connections, and more to the features of Home Edition.
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Work offline or access your computer remotely with ease with wireless networking support, configuration wizards, improved power management and more.
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- **Integrated and current**
Integrate with Windows Servers and management solutions and keep your system current with automatic Windows Update.

Q0447	FULL	\$445
Q0452	FULL	\$299
Q0455	UPGRADE	\$159
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Q0459	UPGRADE - ACADEMIC*	\$125

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Windows Server 2003 R2 extends the Windows Server 2003 operating system, providing a more efficient way to manage and control access to local and remote resources while easily integrating into your existing Windows Server 2003 environment. Windows Server 2003 R2 provides a scalable, security-enhanced Web platform and enables new scenarios including simplified branch server management, improved identity and access management, and more efficient storage management. This page provides an overview of benefits, new features, and improvements in Windows Server 2003 R2.

BENEFITS

Building upon the increased security, reliability, and performance provided by Windows Server 2003 Service Pack 1 (SP1), Windows Server 2003 R2 extends connectivity and control to local and remote resources. Organisations can benefit from reduced costs and increased efficiencies gained through enhanced management and control over resources across the enterprise.

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Q0422 PRO **\$575**
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MICROSOFT PROFESSIONAL EDITION 2003
ACADEMIC

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L0804 PROFESSIONAL FULL **\$779**

L0805 UPGRADE **\$515**

L0803 ACADEMIC* **\$255**


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Microsoft Office Small Business Edition 2003 is a personal and business productivity solution that enables small-business employees to:

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- Create impressive sales and marketing materials
- Manage e-mail and share information efficiently and securely

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L0827 UPGRADE **\$439**


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L0800 OFFICE STANDARD **\$625**

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MICROSOFT SOFTWARE

MICROSOFT PUBLISHER 2003



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L0820	FULL	\$275
L0821	UPGRADE	\$159
L0822	ACADEMIC*	\$145

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Visio 2003 is a diagramming program that can help you create business and technical diagrams that document and organise complex ideas, processes, and systems. Diagrams created in Visio 2003 enable you to visualise and communicate information clearly, concisely, and effectively in ways that text and numbers cannot.

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MICROSOFT FRONTPAGE 2003



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L3556	FULL	\$1585
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L3562	ACADEMIC*	\$297

MICROSOFT INFOPATH 2003



Gather information flexibly and efficiently in rich, dynamic forms and more effectively share, reuse, and repurpose information throughout your team or organization. InfoPath 2003 helps improve collaboration and decision-making to positively impact your business.

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L0830	ACADEMIC*	\$149

MICROSOFT ONENOTE 2003



OneNote 2003 is a new program in the Microsoft Office System that enables you to capture, organise, and reuse your notes on laptop computers, desktop computers, or Tablet PCs.

L0906	FULL	\$149
L0907	ACADEMIC*	\$79

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MCAFEE SOFTWARE

**McAfee®
Wireless Home
Network Security**

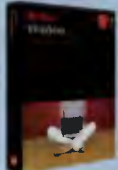
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- One click allows up to 5 users to connect to the network
- Supports the latest and most popular wireless routers
- Automatic security key generation and rotation
- Supports gaming mode



T5616

\$59**McAfee® VirusScan®**

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- Automatically scans files, email attachments, Internet downloads and Internet messaging attachments.
- Automated, daily updates



S9377

\$79

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NEW McAfee® Easy PC Protection provides the essential elements for protecting your PC. Protection from viruses, spyware, and hacker attacks all in the one box.

T5617

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- Blocks hackers from invading your PC
- Filters unwanted and inappropriate email
- Detects spying and pop-up ad programs
- Protects against identity theft

T0810

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STANDARD 11**

Crystal Reports can help you create flexible, high-fidelity reports and tightly integrate them into applications. Learn how the features make it a world standard for enterprise reporting.

R6067

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PROFESSIONAL 11**

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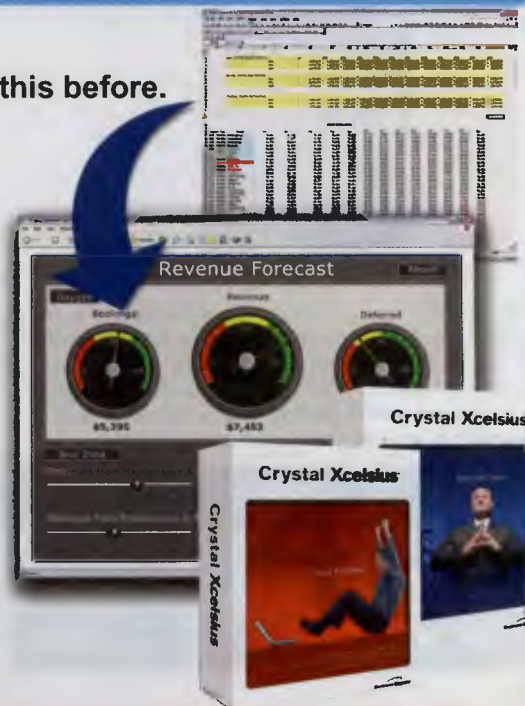
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T5625 PROFESSIONAL

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T5624 STANDARD

\$311

VALUE PACKED BUNDLE

NORTON INTERNET SECURITY 2006 / NORTON GHOST 10.0 BUNDLE + LOGITECH USB HEADSET



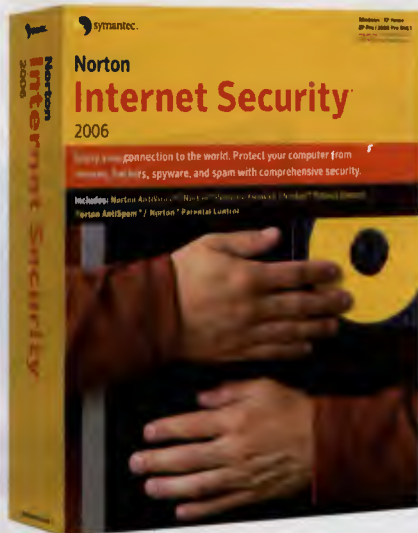
Enjoy your connection to the world plus save the things you care about. Norton Internet Security 2006 protects your computer from viruses, hackers, spyware and spam with comprehensive security.

While with Norton Ghost 10.0 you can back-up everything on your computer - from digital photos to your valuable music collection. Save the stuff you care about with the new Norton Ghost. From photos and music to tax documents, Norton Ghost 10.0 automatically backs up and recovers everything on your computer. Reliable, efficient, and versatile, Norton Ghost optimises backup space, works with a wide range of media devices, and brings back your entire system in a few short steps.

Headset valued at \$69.95 RRP

T5678 BUNDLE PRICE

\$125



NORTON INTERNET SECURITY 2006

Enjoy your connection to the world. Norton Internet Security™ 2006 gives you the confidence to travel the Internet like never before. A comprehensive set of award-winning tools, Norton Internet Security automatically blocks hackers, viruses, and spyware. It filters out phishing email and spam, while its privacy and parental controls protect your personal information and shield your children from harm. And should your operating system or browser have a security hole, Norton Internet Security is there to handle resulting attacks. With all these tools working for you, you're free to get connected, stay connected, and use the Internet however you want.

T0683 SINGLE USER

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T0690 3 USER

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Save the stuff you care about with the new Norton Ghost. From photos and music to tax documents, Norton Ghost 10.0 automatically backs up and recovers everything on your computer. Reliable, efficient, and versatile, Norton Ghost optimises backup space, works with a wide range of media devices, and brings back your entire system in a few short steps.

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T0563 ACADEMIC

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NORTON ANTIVIRUS 2006



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- New! Proactively blocks Home Page hijacking spyware, for improved protection that does not require definition updates
- New and Improved! Automatically handles removal of all kinds of malicious programs, including Spyware

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T0598 ACADEMIC

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PRODUCTION SUITE

The Vegas+DVD Production Suite combines Vegas 6, DVD Architect™ 3, and Dolby Digital® AC-3 encoding software to offer an integrated environment for all phases of video, audio, DVD, and broadcast production. A must for the professional media producer, this suite lets you edit and process DV, HDV, and SD/HD-SDI in real-time, manipulate audio with unparalleled precision, and efficiently author menu-based and single-title DVDs.

S0374 **DELIVERY ONLY \$919**

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Watch TV on your desktop. Composite Input for camcorder or Foxtel input.

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ACID PRO 6



ACID Pro® 6 software is a full-featured digital audio workstation for composing, recording, editing, mixing, and arranging audio and MIDI. Its signature pick, paint, and play interface gets students creating music right out of the box.

T5692 **DELIVERY ONLY \$545**

SOUND FORGE AUDIO STUDIO 8



Sound Forge® Audio Studio™ software is everything you need to produce professional-quality audio on your home computer.

S8653 **\$159**

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Watch TV on your desktop. Composite or SVHS Input for camcorder or Foxtel input.

Q2054 **\$229**

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S7332



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SOUND FORGE 8



Sound Forge® 8 software is the professional's choice for audio editing, recording, effects processing, streaming content creation. Real-time editing and more.

R1865 **\$439**

VEGAS MOVIE STUDIO + DVD 6
PLATINUM EDITION

Import and edit HDV as easily as DV with Vegas Movie Studio™+DVD Platinum video editing software. Powerful DVD creation tools. Over 600 customisable video effects and transitions.

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SERVICES

SERVICES



ON-SITE INSTALLATION OF STANDALONE DESKTOP/NOTEBOOK (1 hour service)

This service provides for the on-site unpacking, setup and configuration of a single desktop or notebook PC and those external peripherals such as a printer or scanner which were purchased along with the desktop or notebook PC from Harris Technology. Service performed will include the configuration of internet access and setting up an E-Mail account as per the customer provided details. Services include brief training on the features of the desktop or notebook, how to avoid viruses and how to perform a system restore/recovery.

Product Code: HT018

Part Number: M4290

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Product Code: HT064

Part Number: M4296

Price: \$99

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Product Code: HT019

Part Number: M4652

Price: \$124

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THE NEW DOORWAY TO GAMING DOMINANCE

Professional gamers agree: Creative Sound Blaster X-Fi is the difference between getting fans and getting fragged.

Gaming is serious business these days. Professional gamers are raking in massive sums of money making their rounds in the competitive circuits. As the competition gets tougher, the need to carve out an edge becomes all the more pressing. The best gamers, like the undisputed king of the hill Johnathan "Fatal1ty" Wendel, are therefore turning to a thus far underutilised asset to give them the much needed edge over their opponents: audio. Little wonder, then, that they have been hailing Sound Blaster X-Fi as the new holy grail of gaming - an absolute must-have for every serious gamer.

Let's find out why.

THE NEED FOR SPEED(X-RAM).

All discerning gamers know that frame rates is one of the major factors that determines whether you end up at the top of the podium, or six feet under. Many fork out hundreds of dollars on extra RAM and a new video card just to gain a measly 3 to 5 percent improvement. Sound Blaster X-Fi is a much more cost-effective option. In our Battlefield

2 benchmarks, for example, we noted a 40% increase in frame rates as compared to motherboard audio solutions, and this with

EAX 5.0 and all

Sound Blaster enhancements turned on to boot! And on the versions of Sound Blaster X-Fi that feature 64MB X-RAM (Fatal1ty FPS and Elite Pro), there's the potential for a further performance boost!

FRAGGING WITH YOUR EARS.

Mastering the interpretation of positional audio cues is a secret that true gaming gurus use to outplay their opponents. Accurate and clear positional audio is hence of extreme importance. And it is in this department that Sound Blaster X-Fi really shines. With Creative's proprietary CMSS-3D technology, you'll be able to pinpoint your enemies with unerring accuracy. It gets better. You'll even be able to enjoy the

benefits of positional audio on a regular pair of headphones! CMSS-3D Headphone creates ten virtual speakers around, above and below you,

providing such realistic 3D positional, elevation and proximity effects that you'll forget you are wearing headphones! Just to prove how powerful this new technology is, our tests drew disbelieving and downright awestruck looks from all our test subjects, who then proceeded to search the room for hidden speakers.

HEAR THE REAL DEAL.

Accurate audio is only useful if you can hear the whole picture. Because the older generation sound cards weren't able to process large numbers of voices, developers were forced to introduce voice culling, leading to greatly reduced realism. Imagine being unable to hear where the sniper who's taking pot-shots at you is firing from just because the sound card killed that audio track to make room for others. Say goodbye to such problems with Sound Blaster X-Fi, which handles a whopping 128 voices. Throw in X-Fi 24-bit Crystalizer - which upgrades existing audio to Xtreme Fidelity and what you'll get is your games, MP3 audio and CD audio sounding more dynamic and realistic than you could ever imagine.



Also available:

X-Fi XtremeMusic • PCI Solution For Music Lovers After An Unbeatable Music Listening Experience • 109dB SNR
X-Fi Platinum • The Perfect Solution For PC-Based Home Theater And Entertainment • I/O Drive • 109dB SNR
X-Fi Elite Pro • The Definitive Audio Creation & Home-Theater Solution • I/O Console • 116dB SNR • X-RAM



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December 2005



APC Magazine
X-Fi Elite Pro
November 2005



pc world
RECOMMENDS
Australian PC World
X-Fi Fatal1ty FPS
November 2005



iF award
Atomic MPC
X-Fi Fatal1ty FPS
November 2005



PC Games Addict
X-Fi
November 2005

"CMSS 3D on the X-Fi lives up to Creative's hype, creating a surround sound environment that enables you to target enemies with pinpoint accuracy in FPS games, whilst creating a realistic soundstage when listening to music tracks" - PC Games Addict, NOV 2005

THE CONCLUSION?

No matter which X-Fi card you look at, it's a revolution in PC audio. All of Creative's new Sound Blaster X-Fi range include a host of features not found in any other PC audio solution such as EAX 5.0, CMSS-3D and 24-bit Crystalizer. In addition Creative has tailored each card to meet your individual needs. There's X-Fi XtremeMusic which provides a simple PCI upgrade solution for those who want to dramatically improve on their current on-board audio solution, or X-Fi Platinum for an additional drive bay. X-Fi Fatal1ty FPS also adds 64MB of X-RAM, whilst the X-Fi Elite Pro is the definitive audio creation, gaming and home-theater solution with its external I/O console, 116dB SNR and X-RAM.

COMPANION PRODUCTS:

Pair Sound Blaster X-Fi with these companion products for the best possible experience.

HEADPHONES



Creative Digital Wireless Headphones CB2530



Creative Noise Cancelling Headphones HN-700

SPEAKERS



Creative Gigaworks™ S750



Creative I-Trigue 5600

DIGITAL AUDIO PLAYERS



Creative ZEN MicroPhoto 8GB Capacity



Creative ZEN Vision M 30GB Capacity



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